

VPDES PERMIT FACT SHEET

This document gives pertinent information concerning the reissuance of the VPDES permit listed below. This permit is being processed as a minor, industrial permit. The effluent limitations contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260-00 et seq. The discharge results from non-contact cooling water and sump water from a hydroelectric operation. The permit process consists of reissuing the permit for approximately 5 years with effluent limits for temperature and pH.

1. **FACILITY NAME AND ADDRESS:** **SIC CODE:** 4911
Claytor Hydroelectric Plant
8355 Little River Dam Road
Radford, VA 24141

LOCATION: on Claytor Lake in southeastern Pulaski County, 0.6 miles off Little River Dam Road

2. **PERMIT NUMBER:** VA0087084 **EXISTING PERMIT EXPIRATION DATE:** June 22, 2009

3. **OWNER CONTACTS:**

CORPORATE FACILITY CONTACT:

Name: Alan Wood, P.E.
Title: Manager, Water & Ecological Resource Services
Phone: 614-716-1233
E-mail: arwood@aep.com

CORPORATE ENVIRONMENTAL CONTACT:

Name: Jon Magalski
Title: Environmental Specialist
Phone: 614-716-2240
E-mail: jmmagalski@aep.com

LOCAL STAFF CONTACT:

Name: David Bailey, P.E.
Title: Energy Production Supervisor
Phone: 540-985-2864
E-mail: dwbailey@aep.com

OWNER CONTACT (TO RECEIVE PERMIT):

Name: John M. McManus
Title: Vice President, Environmental Services
Phone: 614-716-1268

**State "FY2003 Transmittal Checklist" to Assist in Targeting
Municipal and Industrial Individual NPDES Draft Permits for Review**

Part I. State Draft Permit Submission Checklist

In accordance with the MOA established between the Commonwealth of Virginia and the United States Environmental Protection Agency, Region III, the Commonwealth submits the following draft National Pollutant Discharge Elimination System (NPDES) permit for Agency review and concurrence.

Facility Name: Claytor Hydroelectric Plant
 NPDES Permit Number: VA0087084
 Permit Writer Name: Bob Tate
 Date: 3/12/09

Major Minor Industrial Municipal

I.A. Draft Permit Package Submittal Includes:

	Yes	No	N/A
1. Permit Application?	X		
2. Complete Draft Permit (for renewal or first time permit – entire permit, including boilerplate information)?	X		
3. Copy of Public Notice?	X		
4. Complete Fact Sheet?	X		
5. A Priority Pollutant Screening to determine parameters of concern?	X		
6. A Reasonable Potential analysis showing calculated WQBELs?	X		
7. Dissolved Oxygen calculations?			X
8. Whole Effluent Toxicity Test summary and analysis?			X
9. Permit Rating Sheet for new or modified industrial facilities?			X

I.B. Permit/Facility Characteristics

	Yes	No	N/A
1. Is this a new or currently unpermitted facility?		X	
2. Are all permissible outfalls (including combined sewer overflow points, non-process water and storm water) from the facility properly identified and authorized in the permit?	X		
3. Does the fact sheet or permit contain a description of the wastewater treatment process?	X		

I.B. Permit/Facility Characteristics – cont. (FY2003)	Yes	No	N/A
4. Does the review of PCS/DMR data for at least the last 3 years indicate significant non-compliance with the existing permit?		X	
5. Has there been any change in streamflow characteristics since the last permit was developed?	X		
6. Does the permit allow the discharge of new or increased loadings of any pollutants?			X
7. Does the fact sheet or permit provide a description of the receiving water body(s) to which the facility discharges, including information on low/critical flow conditions and designated/existing uses?	X		
8. Does the facility discharge to a 303(d) listed water?	X		
a. Has a TMDL been developed and approved by EPA for the impaired water?		X	
b. Does the record indicate that the TMDL development is on the State priority list and will most likely be developed within the life of the permit?		X	
c. Does the facility discharge a pollutant of concern identified in the TMDL or 303(d) listed water?		X	
9. Have any limits been removed, or are any limits less stringent, than those in the current permit?		X	
10. Does the permit authorize discharges of storm water?	X		
11. Has the facility substantially enlarged or altered its operation or substantially increased its flow or production?		X	
12. Are there any production-based, technology-based effluent limits in the permit?		X	
13. Do any water quality-based effluent limit calculations differ from the State's standard policies or procedures?		X	
14. Are any WQBELs based on an interpretation of narrative criteria?		X	
15. Does the permit incorporate any variances or other exceptions to the State's standards or regulations?	application monitoring waiver		
16. Does the permit contain a compliance schedule for any limit or condition?		X	
17. Is there a potential impact to endangered/threatened species or their habitat by the facility's discharge(s)?		X	
18. Have impacts from the discharge(s) at downstream potable water supplies been evaluated?	X		
19. Is there any indication that there is significant public interest in the permit action proposed for this facility?		X	
20. Have previous permit, application, and fact sheet been examined?	X		

Part II. NPDES Draft Permit Checklist (FY2003)

Region III NPDES Permit Quality Review Checklist – For Non-Municipals

(To be completed and included in the record for all non-POTWs)

II.A. Permit Cover Page/Administration

	Yes	No	N/A
1. Does the fact sheet or permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?	X		
2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?	X		

II.B. Effluent Limits – General Elements

	Yes	No	N/A
1. Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?	X		
2. Does the fact sheet discuss whether “antibacksliding” provisions were met for any limits that are less stringent than those in the previous NPDES permit?	X		

II.C. Technology-Based Effluent Limits (Effluent Guidelines & BPJ)

	Yes	No	N/A
1. Is the facility subject to a national effluent limitations guideline (ELG)?		X	
a. If yes, does the record adequately document the categorization process, including an evaluation of whether the facility is a new source or an existing source?			X
b. If no, does the record indicate that a technology-based analysis based on Best Professional Judgement (BPJ) was used for all pollutants of concern discharged at treatable concentrations?			X
2. For all limits developed based on BPJ, does the record indicate that the limits are consistent with the criteria established at 40 CFR 125.3(d)?			X
3. Does the fact sheet adequately document the calculations used to develop both ELG and /or BPJ technology-based effluent limits?	X		
4. For all limits that are based on production or flow, does the record indicate that the calculations are based on a “reasonable measure of ACTUAL production” for the facility (not design)?			X
5. Does the permit contain “tiered” limits that reflect projected increases in production or flow?		X	
a. If yes, does the permit require the facility to notify the permitting authority when alternate levels of production or flow are attained?			X
6. Are technology-based permit limits expressed in appropriate units of measure (e.g., concentration, mass, SU)?			X

II.C. Technology-Based Effluent Limits (Effluent Guidelines & BPJ) – cont.

	Yes	No	N/A
7. Are all technology-based limits expressed in terms of both maximum daily, weekly average, and/or monthly average limits?			X
8. Are any final limits less stringent than required by applicable effluent limitations guidelines or BPJ?		X	

II.D. Water Quality-Based Effluent Limits

	Yes	No	N/A
1. Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?	X		
2. Does the record indicate that any WQBELs were derived from a completed and EPA approved TMDL?			X
3. Does the fact sheet provide effluent characteristics for each outfall?		X	
4. Does the fact sheet document that a "reasonable potential" evaluation was performed?	X		
a. If yes, does the fact sheet indicate that the "reasonable potential" evaluation was performed in accordance with the State's approved procedures?	X		
b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?		X	
c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have "reasonable potential"?			X
d. Does the fact sheet indicate that the "reasonable potential" and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations where data are available)?			X
e. Does the permit contain numeric effluent limits for all pollutants for which "reasonable potential" was determined?			X
5. Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet?	X		
6. For all final WQBELs, are BOTH long-term (e.g., average monthly) AND short-term (e.g., maximum daily, weekly average, instantaneous) effluent limits established?		X	
7. Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)?	X		
8. Does the fact sheet indicate that an "antidegradation" review was performed in accordance with the State's approved antidegradation policy?	X		

FY2003

II.E. Monitoring and Reporting Requirements (FY2003)	Yes	No	N/A
1. Does the permit require at least annual monitoring for all limited parameters?	X		
a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver?			X
2. Does the permit identify the physical location where monitoring is to be performed for each outfall?	X		
3. Does the permit require testing for Whole Effluent Toxicity in accordance with the State's standard practices?			X

II.F. Special Conditions	Yes	No	N/A
1. Does the permit require development and implementation of a Best Management Practices (BMP) plan or site-specific BMPs?	X		
a. If yes, does the permit adequately incorporate and require compliance with the BMPs?	X		
2. If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements?			X
3. Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations?	X		

II.G. Standard Conditions	Yes	No	N/A
1. Does the permit contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions?	X		

List of Standard Conditions – 40 CFR 122.41		
Duty to comply	Property rights	Reporting Requirements
Duty to reapply	Duty to provide information	Planned change
Need to halt or reduce activity not a defense	Inspections and entry	Anticipated noncompliance
Duty to mitigate	Monitoring and records	Transfers
Proper O & M	Signatory requirement	Monitoring reports
Permit actions	Bypass	Compliance schedules
	Upset	24-Hour reporting
		Other non-compliance

2. Does the permit contain the additional standard condition (or the State equivalent or more stringent conditions) for existing non-municipal dischargers regarding pollutant notification levels [40 CFR 122.42(a)]?	X		
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Part III. Signature Page (FY2003)

Based on a review of the data and other information submitted by the permit applicant, and the draft permit and other administrative records generated by the Department/Division and/or made available to the Department/Division, the information provided on this checklist is accurate and complete, to the best of my knowledge.

Name	<u>Bob Tate</u>
Title	<u>water permit writer</u>
Signature	<u><i>Robert S. Tate</i></u>
Date	<u>3/12/09</u>

4. **APPLICATION COMPLETE DATE:** March 17, 2009

PERMIT DRAFTED BY: Bob Tate (BRRO) **DATE:** April 1, 2009

REVIEWED BY: Kip Foster **DATE:** April 6, 2009

PUBLIC COMMENT PERIOD DATES: from May 5, 2009 to June 4, 2009

5. **RECEIVING WATERS:**

Receiving Stream:	New River
River Mile:	86.95
Basin:	New River
Subbasin:	N/A
Section:	2b
Class:	IV
Special Standards:	PWS, v
1 Day, 10-Year Low Flow (1Q10):	357 MGD*
7 Day, 10-Year Low Flow (7Q10):	447 MGD*
30 Day, 10-Year Low Flow (30Q10):	506 MGD*
30 Day, 5-Year Low Flow (30Q5):	563 MGD*
1 Day, 10-Year High Flow** (HF1Q10):	404 MGD*
7 Day, 10-Year High Flow** (HF7Q10):	594 MGD*
30 Day, 10-Year High Flow** (HF30Q10):	812 MGD*
Harmonic Mean Flow (HM):	1144 MGD*
Tidal?	No
On 303(d) list?	yes (PCBs)***

*Flow frequency documentation is in APPENDIX B.

**High flow months are January through May.

***2008 Impaired Waters fact sheet is in APPENDIX B.

6. **OPERATOR LICENSE REQUIREMENTS:** None

7. **RELIABILITY CLASS:** None

8. **PERMIT CHARACTERIZATION:**

Private Federal State POTW
 Possible Interstate Effect Interim Limits in Other Document

9. **WASTEWATER TREATMENT SYSTEM:** A schematic flow diagram, outfall descriptions, and descriptions of the water processes are included in APPENDIX A. Table I (below) lists outfalls, discharge sources, flows, and treatments.

TABLE I DISCHARGE DESCRIPTIONS			
Outfall	Discharge Source/Description	Flow	Treatment
001	non-contact cooling water for north generator air cooler and for thrust bearing cooler – generating unit 1	0.4 MGD	none
002	non-contact cooling water for north generator air cooler and for thrust bearing cooler – generating unit 2	0.4 MGD	none
003	non-contact cooling water for north generator air cooler and for thrust bearing cooler – generating unit 3	0.4 MGD	none
004	non-contact cooling water for north generator air cooler and for thrust bearing cooler – generating unit 4	0.4 MGD	none
005	non-contact cooling water for south generator air cooler generating unit 1	0.3 MGD	none
006	non-contact cooling water for south generator air cooler generating unit 2	0.3 MGD	none
007	non-contact cooling water for south generator air cooler generating unit 3	0.3 MGD	none
008	non-contact cooling water for south generator air cooler generating unit 4	0.3 MGD	none
009	turbine seal water for lubricating and non-contact cooling generating unit 1	0.036 MGD	none
010	turbine seal water for lubricating and non-contact cooling generating unit 2	0.036 MGD	none
011	turbine seal water for lubricating and non-contact cooling generating unit 3	0.036 MGD	none
012	turbine seal water for lubricating and non-contact cooling generating unit 4	0.036 MGD	none
013	draft tube dewatering and backup to 014 – see below	0.864 MGD	oil/water skimmer
014	air compressor cooling water; shaft leakage; dam leakage; floor drains; some roof drains; screen cleaning water	0.72 MGD	oil/water skimmer
015	storm water from transformer deck and some dam seepage	variable	oil/water separator

The Claytor Hydroelectric Plant is made up of four 20 megawatt units that were placed into commercial service in 1939. The units are identical in both the design and materials of construction. The units are generally equally operated. Discharges from the four units are similar due to the common unit design and common water source (common intake on Claytor Lake/New River). Service water is withdrawn from Claytor Lake 80 feet below the surface and passed through one of two twin 3/32" mesh basket screens.

As the rotor of a hydroelectric generator turns and creates a current in the surrounding coils, waste heat is generated. Generator air coolers, two per unit, are situated on each side of the generator to absorb this heat and maintain a cooler air temperature within the generator. The two generator air coolers for each unit are identified as "north" and "south." The coolers are radiator-like devices made up of a series of small tubes that were originally made of copper. As a pollution prevention effort, the permittee replaced the copper tubes with stainless steel tubes in all units. Service water is passed through the stainless steel tubes. Heat is absorbed by the cooler water within the tubes as the warm air of the generator passes across the surface.

Thrust bearings are located at the point where the rotor rests on its support structure allowing for unencumbered rotation of the shaft. The purpose of the thrust bearing coolers is to lower elevated lubricating oil temperatures caused by friction between the thrust bearing and the rotor. The transfer of heat is accomplished by passing the heated oil over a series of cooling coils containing service water.

Outfalls 001, 002, 003 and 004, for generating units 1, 2, 3 and 4, respectively, are comprised of non-contact cooling water used to cool the north generator air coolers and the thrust bearing coolers. Water leaving the north generator air cooler and the thrust bearing cooler of each separate generating unit combines and discharges from four separate pipes at the tailrace. Outfalls 005, 006, 007, and 008 release water from the south generator air coolers for generating units 1, 2, 3 and 4, respectively. These effluents discharge from four separate pipes at the tailrace. Effluents from Outfalls 001-008 receive no treatment.

Turbine seal water flows by gravity through openings in the upper runner seal to reduce friction caused by the rotation of the water wheels. The water then diffuses through the wicket gates, where it combines with circulating water used to operate each generating unit and discharges to the tailrace. These discharges do not contact any plant processes or process water and effluent quality is estimated as equivalent to the influent quality. The turbine seal water discharges are designated as Outfalls 009, 010, 011 and 012 for generating units 1, 2, 3 and 4, respectively. Effluents from Outfalls 009-012 receive no treatment.

Outfall 013 is the discharge of a 50 hp self-priming pump that withdraws water 12 inches from the bottom of the facility sump. It is used to drain the sump during draft tube dewatering to enable maintenance and inspection of the draft tubes. Discharge from this pump exits through Outfall 013. This pump also serves as an emergency backup to the primary sump pumps (see Outfall 014). The 50 hp pump is tested monthly for about 5 minutes, discharging 1,000 to 6,000 gallons. During dewatering the flow would be 0.3 to 0.9 MGD. Effluent will have characteristics similar to intake water during dewatering and similar to Outfall 014. The high flow rate from the emergency pump will tend to scour any settled material in the sump and discharge it. Sump water is treated with a new oil/water skimmer and absorbent pillows.

Outfall 014 is the normal discharge from two 10 hp pumps (each capable of 250 gpm) that drain the sump. If both pumps ran continuously for 24 hours, the discharge could be 0.72 MGD. Pumps withdraw from the bottom of the sump. The sump is a collection area for packing water and wicket gate leakage from all four generating units. In addition, water from the pressure relief wells in the plant's lower tunnel, storm water from certain areas of the power house roof, dam leakage, supernatant from intake screen cleaning, air compressor blowdown and storm water. In the event of failure of the primary sump pumps or draft tube dewatering, the emergency pump discussed above is used to move water from the sump. Sump water is treated with a new oil/water skimmer and absorbent pillows.

Outfall 015 discharges storm water runoff from 2.7 acres. Most of the storm water comes from a steep rocky slope on the south bank of the New River near the powerhouse. Other drainage is from the dam's transformer deck. Drainage from the transformer deck goes through a 25,000 gallon oil/water separator before reaching Outfall 015. The oil/water separator was installed for Spill Prevention Contamination and Control compliance, not for storm water treatment. The separator can store (a) more mineral oil than is in all the transformers or (b) more storm water runoff from the transformer deck than would be provided by a 25-year, 24-hour storm event. Outfall 015 also discharges a negligible amount of dam seepage.

Some dam leakage is routed directly to the tailrace.

APPENDIX A contains a copy of the site visit report.

10. **SEWAGE SLUDGE USE OR DISPOSAL:** Not applicable
11. **DISCHARGE LOCATION DESCRIPTION:** latitude N 37° 04' 30", longitude W 80° 35' 05"
APPENDIX A contains a copy of 7.5 minute series USGS topographic maps for Radford South, Virginia indicating the discharge location on the New River (Water Body ID# VAW-N18R).
12. **MATERIAL STORAGE:** Material storage includes small amounts of paint, cleaning products, and hydraulic/lubricating oil. A diesel fuel storage tank is located on the transformer deck.
13. **AMBIENT WATER QUALITY:** The receiving water body is the New River, which is within Section 2b of the New River basin as listed in the State Water Control Board's Water Quality Standards (WQS), River Basin Section Tables (9 VAC 25-260-430). The receiving stream is Class IV and is a Public Water Supply (PWS) with special standard 'v'. Class IV water quality standards include the following:
- dissolved oxygen – 4.0 mg/L minimum and 5.0 mg/L daily average,
 - pH – 6.0 to 9.0 SU,
 - temperature – 31°C maximum.

The "v" special standard (Virginia Water Quality Standards 9 VAC 25-260-310.v) mandates a maximum temperature of 29°C. This permit protects the stream to the 29°C temperature standard.

The receiving segment is impaired for PCBs in fish tissue and is on the current 303(d) list. APPENDIX B contains the 2008 Impaired Waters fact sheet. This facility is highly unlikely to discharge PCBs.

The previous Flow Frequency Determination Memorandum (dated May 12, 2004) was updated February 24, 2009 for this permit reissuance. APPENDIX B contains copies of the two memos and other flow frequency documentation. Flow determination methodology is explained in the memos.

There are no representative STORET Stations for receiving stream data. Outfalls 001-014 are at the dam tailrace, where water moves swiftly. Monitoring data from monitoring stations in Claytor Lake (9-NEW087.14 and 9-NEW089.34) could be significantly different due to depth and flow. The nearest downstream station (9-NEW084.34) has only 8 samples, all collected in 1989. The next downstream station (9-NEW081.72) is at the Route 11 bridge in Radford, over 5 miles from the outfalls at river mile 86.95. Data from station 9-NEW081.72 was used to determine stream information (hardness, temperature, pH) for the Water Quality Criteria/Wasteload Allocation Analysis (WQC/WLA) spreadsheets. APPENDIX B contains STORET station 9-NEW081.72 data.

Mixing at the point of discharges is assumed 100% for all flow conditions. All outfalls except the storm water outfall (015) discharge to the tailrace, where water flows rapidly and mixing should be optimal. DEQ's MIX program is not useful for this situation.

14. **ANTIDEGRADATION REVIEW AND COMMENTS: Tier II**

The State Water Control Board's Water Quality Standards (WQS) (9 VAC 25-260-30) provide all state surface waters one of three levels of antidegradation protection. For Tier I, existing uses of the water body and the water quality must be maintained. A Tier II water body has water quality that is better than the narrative and numeric water quality criteria. Significant lowering of the water quality of a Tier II water is not allowed without an evaluation of the economic and social impacts, as required by Water Quality Standards, 9 VAC 25-260-30. A Tier III water body is an exceptional water body that is designated by regulation. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The antidegradation review begins with the Tier determination. The 2008 Impaired Waters fact sheet indicates the receiving segment of the New River is impaired for "PCB in Fish Tissue" and not supporting the fish consumption use. (APPENDIX B contains the 2008 Impaired Waters fact sheet.) Because the impairment is determined by PCBs in fish tissue rather than PCBs in the water column, Tier II is appropriate. Therefore the New River at the discharge location is classified as a Tier II water, and no significant degradation of existing quality is allowed.

For purposes of aquatic life protection, "significant degradation" means that no more than 25% the difference between the acute and chronic aquatic criteria values and the existing quality (unused assimilative capacity) may be allocated. For purposes of human health protection, "significant degradation" means that no more than 10% of the difference between the human health criteria and the existing quality (unused assimilative capacity) may be allocated. The significant degradation baseline (antidegradation baseline) is calculated for each pollutant as follows:

Antidegradation baseline (aquatic life) = 0.25 (WQS – existing quality) + existing quality

Antidegradation baseline (human health) = 0.10 (WQS – existing quality) + existing quality

Where:

"WQS" = Numeric criterion listed in 9 VAC 25-260-5 et seq. for the parameter analyzed

"Existing quality" = Concentration of the parameter being analyzed in the receiving stream, including the facility's existing discharge.

When applied, the antidegradation baselines become the new water quality criteria to prevent significant degradation of the receiving stream. Effluent limits for future expansions or new facilities must be written to maintain the antidegradation baselines for each pollutant. Antidegradation baselines have been calculated for this facility as described above, in accordance with Guidance Memorandum (GM) 00-2011. Baselines are subject to change based on additional stream and/or effluent information. Antidegradation baselines and allocations calculated for this permit reissuance are in the WQC/WLA spreadsheets in APPENDIX D.

The facility's discharges are existing and the application does not indicate an expansion or proposed increase in the discharge of pollutants via this outfall. As the facility is not proposing any increase in the loading of any pollutants, the permit limits are in compliance with antidegradation requirements set forth in the 9 VAC 25-260-30.

15. **SITE VISIT:** On February 18, 2009, the permit writer (Bob Tate) visited the facility for permit reissuance. A copy of the site visit report is included in APPENDIX A.
16. **EFFLUENT SCREENING & LIMITATION DEVELOPMENT:** The effluent limitations and monitoring in this permit for Outfalls 001-004, 005-008, 013, and 014 are discussed below and listed in TABLES II and III below. Discussion of specific parameters follows. Monitoring is not required for Outfalls 009-012 (see discussion below). Outfall 015 is a storm water outfall. APPENDIX C contains effluent application and DMR monitoring data.

APPENDIX A contains current information on the outfalls.

TABLE II							
OUTFALLS 001, 002, 003, 004, 005, 006, 007, & 008 FINAL EFFLUENT LIMITATIONS							
PARAMETER	BASIS FOR LIMITS	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Max. Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow, (MGD)	NA	NL	NA	NA	NL	1/Year	Estimate.
Temperature (°C)	2	NA	NA	NA	29	1/Year*	Immersion stabilization

*Monitoring shall be in July or August, if operating.

Notes:

NA = Not Applicable; NL = No Limitations

The basis for the limitation codes are:

1. Technology-based Limits
2. Water Quality-based Limits
3. Best Professional Judgment-based Limits

Outfalls 009, 010, 011, 012: The quality of effluent from Outfalls 009, 010, 011, and 012 is considered to be equivalent to the intake water. Turbine seal water is discharge from these outfalls. The turbine seal water is river water that is pumped through openings in the stay ring to reduce friction caused by the rotation of the steel water wheel. The water then diffuses through the wicket gates where it combines with the circulating water used to operate the generating unit. The cooling water then discharges directly into the tailrace and is inaccessible for sampling. Any sampling downstream would not be representative. Due to the nature of these discharges (IWC<0.01% and contact with a stainless steel shaft only), there is little or no potential for any water quality impacts from these discharges. These discharges are not limited or monitored. The outfalls are recognized by DEQ as existing and legitimate outfalls, but are not regulated. (Note: there is no monitoring data for Outfalls 009-012; data on application assumed same water quality as receiving stream.)

TABLE III OUTFALLS 013 & 014 FINAL EFFLUENT LIMITATIONS							
PARAMETER	BASIS FOR LIMITS	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Max. Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow, (MGD)	NA	NL	NA	NA	NL	1/3 Months*	Estimate.
Temperature (°C)	2	NA	NA	NA	29	1/3 Months*	Immersion stabilization
pH (SU)	2	NA	NA	6.0	9.0	1/3 Months*	Grab
Oil & Grease (mg/L)	NA	NA	NA	NA	NL	1/3 Months	Grab

*1/3 Months = In accordance with the following schedule: 1st quarter (January 1 - March 31, report due April 10);
 2nd quarter (April 1 - June 30, report due July 10);
 3rd quarter (July 1 - Sept 30, report due Oct 10);
 4th quarter (Oct 1 - Dec 31, report due January 10).

Notes:

NA = Not Applicable; NL = No Limitations

The basis for the limitation codes are:

1. Technology-based Limits
2. Water Quality-based Limits
3. Best Professional Judgment-based Limits

Flow: Flow monitoring is required for Outfalls 001, 002, 003, 004, 005, 006, 007, 008, 013, 014 and reported once per year, as in the previous permit. The monitoring frequency was reduced from monthly to annually in the 2004-2009 permit, in accordance with GM 00-2011. In this permit monitoring for Outfalls 013 and 014 is quarterly. See the section **Monitoring Frequency Changes - Outfalls 013 and 014** for more explanation.

Temperature: A maximum temperature limit of 29°C applies to Outfalls 001, 002, 003, 004, 005, 006, 007, 008, 013, and 014, as in the previous permit. The limit's basis is 9 VAC 25-260-310.v (Virginia Water Quality Standards). The receiving segment of the New River has a Class IV designation with "PWS" and "v" special standards. The temperature water quality criterion for Class IV streams is 31°C maximum (9 VAC 25-260-50). The "v" special standard (9 VAC 25-260-310.v) mandates a maximum temperature of 29°C. DMR temperature data from 2001 through 2007 indicate no exceedences of the 29°C limit; 24.0°C was the highest reported temperature for any outfall. (See APPENDIX C.) Suitable stream temperature data are not available because monitoring has not been conducted near the dam. Nevertheless, the New River's 7Q10 of 447 MGD mixed with a maximum discharge of 4.5 MGD at the facility makes it very unlikely that the standard would be exceeded. The permittee has determined it would take at least a 10°C increase in all outfall temperatures to raise the ambient water temperature by 0.1°C. Monitoring of temperature should be performed during the months of highest stream temperature, July and August. At the request of the permittee and in accordance with GM 00-2011, monitoring was reduced from monthly to annually in the 2004-2009 permit. Reduced monitoring was based on historical data and nature of the discharge. This permit continues annual monitoring, in July or August, for Outfalls 001-008. Monitoring for Outfalls 013 and 014 has been changed to quarterly. See the section **Monitoring Frequency Changes - Outfalls 013 and 014** for more explanation. APPENDIX C contains DMR monitoring data for temperature.

pH: Limits of 6.0 (minimum) and 9.0 (maximum) apply to Outfalls 013 and 014, as in the previous permit. The limits' basis is 9 VAC 25-260-50 (Virginia Water Quality Standards). Monitoring and reporting are quarterly; monitoring was annual in the previous permit. (See the section **Monitoring Frequency Changes - Outfalls 013 and 014** for more explanation.)

These outfalls discharge process water from the sump of the facility. The monitoring frequency was reduced from monthly to annually in the 2004-2009 permit, in accordance with GM 00-2011. Reduced monitoring was based on historical data and nature of the discharge. The permittee requested that pH monitoring be discontinued in this permit. The request is denied because pH is a water quality standard parameter. Antibacksliding policy generally prohibits relaxing of water quality-based limits. APPENDIX C contains DMR monitoring data for pH.

In accordance with GM95-012, pH limits were removed from Outfalls 001, 002, 003, 004, 005, 006, 007, and 008 before permit reissuance in 1999. GM95-012 allows removal of some pH limits for "... once through, non-contact cooling water effluents that withdraw from and discharge back to the same source...."

Oil and Grease: There are no limits for oil & grease. This permit initiates oil and grease monitoring for Outfall 013. Monitoring for Outfall 014 is continued from the previous permit. Oil and grease were detected at both outfalls (013 - 25.4 mg/L; 014 - 20.3 mg/L) during application monitoring for this permit reissuance. The permittee believes that both results were aberrations due to poor sampling methodology. Previous monitoring results for 014 indicate a maximum value of 14 mg/L (see APPENDIX C). Absorbent pillows and a new oil/water skimmer (installed in October 2008) remove oil and grease before and after entering the sump. The sump collects and holds all wastewater that is discharged from 013 and 014. Based on the above reasons and limited data, no limitations are believed needed at this time. Monitoring is quarterly, to ensure BMPs remain effective. See the following section **Monitoring Frequency Changes - Outfalls 013 and 014** for more explanation.

Monitoring Frequency Changes - Outfalls 013 and 014: Monitoring of parameters (flow, temperature, pH, Oil & grease) at Outfalls 013 and 014 has been changed from annual to quarterly for consistency with sump outfalls at other APCO hydroelectric facilities. VPDES Permit Manual, Section IN-2, D.2.b (page 50) indicates that "potential presence of toxic or hazardous materials; variability of the wastewater; mode of discharge" are factors to be considered for monitoring frequencies. Outfalls 013 and 014 discharge from the main sump. Discharges from the sump are controlled (intermittent) and assumed to be more variable in content. Oil and grease is a specific concern. Discharges from cooling water outfalls (001-012) are continuous when generators are operating. Cooling water discharges are essentially impounded lake water, less variable and less likely to contain harmful materials in concentrations of concern. Whereas annual monitoring appears adequate for the cooling water outfalls, quarterly monitoring is more appropriate for the two sump outfalls.

Toxics: Application monitoring resulted in chlorine and copper detections for many outfalls. (Application monitoring was representative for Outfalls 001-004 and 005-008.) Chlorine was detected at Outfalls 001, 002, 003, 004, 005, 006, 007, 008, 013, and 014. Chlorine concentrations ranged from 0.32 mg/L to 2.2 mg/L. The permittee believes that the chlorine results were aberrations due to test interference. Considering that intake (lake) water was reported to contain 0.29 mg/L chlorine, the reliability of chlorine monitoring is suspect. Copper was detected at Outfalls 001, 002, 003, 004, 005, 006, 007, 008, and 014. All copper detections were below the intake copper concentration of 21 mg/L. Chlorine and copper were evaluated for reasonable potential using DEQ's STATS program. No limits

were projected for any of the outfalls identified above. STATS output is in APPENDIX D. APPENDIX C contains Form 2C application monitoring data.

In the 2004 permit application, non-conventional toxic water quality parameters were listed as believed absent except for **copper** at Outfall 014 and **cadmium** at Outfalls 001-004. Concentrations detected for both parameters were less than the WLA for the discharge and were not considered significant. No limits were necessary.

PCBs: PCB monitoring for Outfalls 014 and 015 is included in a permit special condition. Justification is provided by 9VAC 25-260-10, 9 VAC 25-260-140, and GM09-2001. 9VAC 25-260-10 and 9 VAC 25-260-140 are part of Virginia's Water Quality Standards. 9VAC 25-260-10 contains the "fishable" designated use. 9 VAC 25-260-140 contains the PCB water quality criterion. GM09-2001 provides the PCB monitoring protocol for TMDL development. A PCB TMDL for the New River is scheduled for completion in 2014. Only Outfalls 014 and 015 will be monitored; all other outfalls except 013 discharge cooling water. Both 013 and 014 discharge from the sump, and for the purposes of PCB monitoring are essentially identical outfalls. GM09-2001 stipulates that the PCB data should not be used for compliance purposes.

Storm water: Outfall 015 discharges storm water runoff from 2.7 acres. Most of the storm water comes from a steep rocky slope on the south bank of the New River near the powerhouse. Other drainage is from the dam's transformer deck. Drainage from the transformer deck goes through a 25,000 gallon oil/water separator before reaching Outfall 015. The oil/water separator was installed for Spill Prevention Contamination and Control compliance, not for storm water treatment. The separator can store more mineral oil than is in all the transformers. The separator can store more storm water runoff from the transformer deck than would be provided by a 25-year, 24-hour storm event. Outfall 015 also discharges a negligible amount of dam seepage. As in the previous permit, there can be no discharge of process wastewater from Outfall 015 and there are no limits or monitoring. APPENDIX C contains Form 2F application monitoring data for Outfall 015.

Reduced Monitoring: All permit applications received after May 4, 1998, are to be considered for reduction in effluent monitoring frequency. GM 98-2005 states that "only facilities having exemplary operations that consistently meet permit requirements should be considered for reduced monitoring." Effluent monitoring is not reduced in this permit reissuance because the 2004-2009 permit granted the greatest reduction allowable (annual monitoring).

17. **ANTIBACKSLIDING STATEMENT:** This permit complies with the antibacksliding requirements of 9 VAC 25-31-220 L. No limits are less stringent than the previous permit.
18. **COMPLIANCE SCHEDULES:** This permit contains a compliance schedule for PCB monitoring and reporting. The monitoring is for TMDL development.

19. SPECIAL CONDITIONS:**Part I.B.1 Notification Levels**

Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-200 A for all manufacturing, commercial, mining, and silvicultural dischargers.

Part I.B.2 Materials Handling/Storage

Rationale: 9 VAC 25-31-50 A prohibits the discharge of any wastes into State waters unless authorized by permit. Code of Virginia § 62.1-44.16 and 62.1-44.17 authorizes the Board to regulate the discharge of industrial waste or other waste.

Part I.B.3 Best Management Practices

Rationale: VPDES Permit Regulation, 9 VAC 25-31-220 K, requires use of best management practices where applicable to control or abate the discharge of pollutants when numeric effluent limits are infeasible or the practices are necessary to achieve effluent limits or to carry out the purpose and intent of the Clean Water Act and State Water Control Law.

This condition is added in lieu of the Operations & Maintenance (O&M) Manual requirement as per Code of Virginia § 62.1-33.16 and 9 VAC 25-31-190 E et seq. An O&M Manual is not required because there is no treatment associated with the facility operations. The BMP Plan shall cover spill procedures, calibration of sampling instruments, reporting, emergency phone numbers, responsible personnel, etc.

Part I.B.4 Cooling Water Additives

Rationale: The permittee should notify DEQ when new additives are proposed. Additives containing priority pollutants should be avoided. 9 VAC 25-31-220 D authorizes the board to monitor and regulate effluents that have reasonable potential to cause or contribute to a Water Quality Standards Violation.

Part I.B.5 Effluent Monitoring Frequencies

Rationale: The permittee is granted a reduction in monitoring frequency based on a history of permit compliance. To remain eligible for the reduction, the permittee should not have violations that result in enforcement actions. If the permittee fails to maintain the previous level of performance, the baseline monitoring frequencies should be reinstated. The incentive for reduced monitoring is an effort to reduce the cost of environmental compliance and to provide incentives to facilities which demonstrate outstanding performance and consistent compliance with their permits. Facilities which cannot comply with specific effluent parameters or have other related violations will not be eligible for this benefit. This is in conformance with Guidance Memorandum No. 98-2005 - Reduced Monitoring and EPA's proposed "Interim Guidance For Performance-Based Reduction of NPDES Permit Monitoring Frequencies" (EPA 833-B-96-001) published in April 1996.

Part I.B.6 TMDL Reopener

Rationale: Section 303(d) of the Clean Water Act requires that total maximum daily loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The re-opener recognizes that, according to Section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under Section 303 of the Act.

Part I.B.7 Claytor Project Relicensure/401 Certification Reopener

Rationale: The Federal Energy Regulatory Commission (FERC) is considering relicensure of the Claytor Project. FERC could require state 401 certification after application for relicensure. 401 certification may cause the Claytor Project to take actions to maintain temperature and dissolved oxygen water quality at the dam's tailrace and further downstream. If requirements are inconsistent with the permit, the permit can be modified or revoked and reissued to comply.

Part I.B.8 PCB Monitoring

Rationale: This special condition requires the permittee to monitor and report PCB concentrations in dry weather and wet weather effluent samples consistent with 9 VAC 25-260-280. The results from this monitoring shall be used to implement the PCB TMDL that is being developed for the New River.

Part II, Conditions Applicable to All Permits

Rationale: VPDES Permit Regulation, 9 VAC 25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

20. **NPDES PERMIT RATING WORK SHEET:** Total Score 50
 The rating worksheet was reviewed for this permit reissuance with no change in score. A copy of the NPDES Permit rating work sheet from the 1999 permit reissuance is in APPENDIX E.
21. **CHANGES TO PERMIT:** Changes to effluent limits or monitoring frequency in this permit are in TABLE IV below. The expiration date of this permit has been moved forward to distribute permit writers' work loads more evenly over a five-year cycle. VPDES permits are normally reissued for five years, so this permit would have expired June 22, 2014. The expiration date was moved forward approximately three weeks to May 31, 2014. The expiration date was moved to the end of a month so that compliance monitoring for the next permit would begin the next day (first day of next complete month).

TABLE IV PERMIT PROCESSING CHANGE SHEET For Effluent Limits and Monitoring Schedule						
Outfall No.	Parameter Changed	Monitoring Requirements Changed		Effluent Limits Changed		Reason for Change
		From	To	From	To	
013	Oil & Grease	NA	1/3 Months	NA	NA	O&G detected in application monitoring
013	Flow, pH, Temperature	1/Year	1/3 Months	NA	NA	consistency with APCO hydroelectric facilities permits (sump outfalls)
014	Flow, pH, Temperature, Oil & Grease	1/Year	1/3 Months	NA	NA	consistency with APCO hydroelectric facilities permits (sump outfalls)
014, 015	PCBs	NA	2 within 2 Years	NA	NA	GM09-2001

Special Conditions Added to or Modified in this Permit

Some special conditions have been added or modified in accordance with the VPDES Permit Manual.

Part I.B.5 Effluent Monitoring Frequencies

This special condition has been added to increase monitoring frequencies if parameter limits are violated.

Part I.B.6 TMDL Reopener

This special condition has been added per the Permit Manual. A PCB TMDL for the New River is scheduled for completion in 2014.

Part I.B.7 Claytor Project Relicensure/401 Certification Reopener

This special condition has been added in case the Federal Energy Regulatory Commission requires state 401 certification after application for relicensure. Potential concerns are maintaining temperature and/or dissolved oxygen water quality. The Claytor Project is currently undergoing relicensure.

Part I.B.8 PCB Monitoring

This special condition has been added in accordance with GM09-2001, which directs PCB monitoring for TMDL development. A PCB TMDL for the New River is scheduled for completion in 2014.

Part II, Conditions Applicable to All VPDES Permits

Some of these conditions have been modified in accordance with the VPDES Permit Manual.

22. **VARIANCES/ALTERNATE LIMITS OR CONDITIONS:**

A waiver request for 8-hour composite sampling in lieu of 24-hour composite sampling (Form 2C Part V.B monitoring) was granted for BOD, COD, TOC, TSS, ammonia, total cadmium, total copper, and hardness. A waiver request was granted for representative application monitoring (Form 2C Part V.A, V.B, and V.C) of the following groups of outfalls: 001-004; 005-008; 009-012. The outfalls in each group discharge non-contact cooling water from identical units.

23. **PUBLIC NOTICE INFORMATION REQUIRED BY 9 VAC 25-31-280 B:** All pertinent information is on file and may be inspected and copied by contacting Bob Tate at:

Virginia Department of Environmental Quality
Blue Ridge Regional Office
3019 Peters Creek Road
Roanoke, VA 24015
540-562-6774
email: rstate@deq.virginia.gov

Persons may comment in writing or by email to the DEQ on the proposed reissuance of the permit within 30 days from the date of the first notice. Comments shall include the name, address, and telephone number of the writer, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing if public response is significant. Requests for public hearings shall state the reason why a hearing is requested, the nature of the issues proposed to be raised in the public hearing and a brief explanation of how the requester's interests would be directly and adversely affected by the proposed permit action. Following the comment period, the Board will make a determination regarding the proposed reissuance. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given.

24. **ADDITIONAL COMMENTS:**

Previous Board Action: None

Staff Comments: The discharge is not controversial and is currently meeting the required effluent limits. The staff believes that the attached final effluent limitations will maintain the WQS adopted by the Board.

Owner Comments: Copies of owner comments and DEQ responses are in Appendix F.

Public Comment: No public comments were received during the public notice period.

25. **303(d) LISTED SEGMENTS (TMDL):** This facility discharges directly to the New River. The stream segment receiving the effluent is listed for non attainment of PCB in fish tissue in part I of the current approved 303(d) list. The TMDL that will be prepared for this segment will not likely have a WLA for this discharge for PCB. No limit for PCB is included in this permit because the effluent is not considered to contain PCB. APPENDIX B contains the 2008 Impaired Waters fact sheet.

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APPENDIX B	Receiving Stream Information Flow Frequency Memoranda February 24, 2009 May 12, 2004 2008 Impaired Water Fact Sheet STORET Data for WQC/WLA spreadsheets' statistics
APPENDIX C	Effluent Information Application Monitoring Data Summaries (Outfalls 001-008, 013-015) DMR Data Summaries temperature (Outfalls 001-008, 013, 014) pH (Outfalls 013, 014) oil & grease (Outfall 014) Statistics for WQC/WLA spreadsheets (from DMRs and application) Outfalls 001-004 Outfalls 005-008 Outfall 013 Outfall 014
APPENDIX D	Water Quality Analyses and Antidegradation Baselines/Allocations WQC/WLA spreadsheets Outfalls 001-004 Outfalls 005-008 Outfall 013 Outfall 014 STATS output chlorine copper
APPENDIX E	NPDES Permit Rating Work Sheet (1999)
APPENDIX F	Owner Comments and DEQ Responses April 28, 2009 comment letter from owner May 26, 2009 comment letter from owner June 1, 2009 response letter from DEQ

APPENDIX A

FACILITY INFORMATION

Location - Topographic Map

Outfalls – Map/Diagram

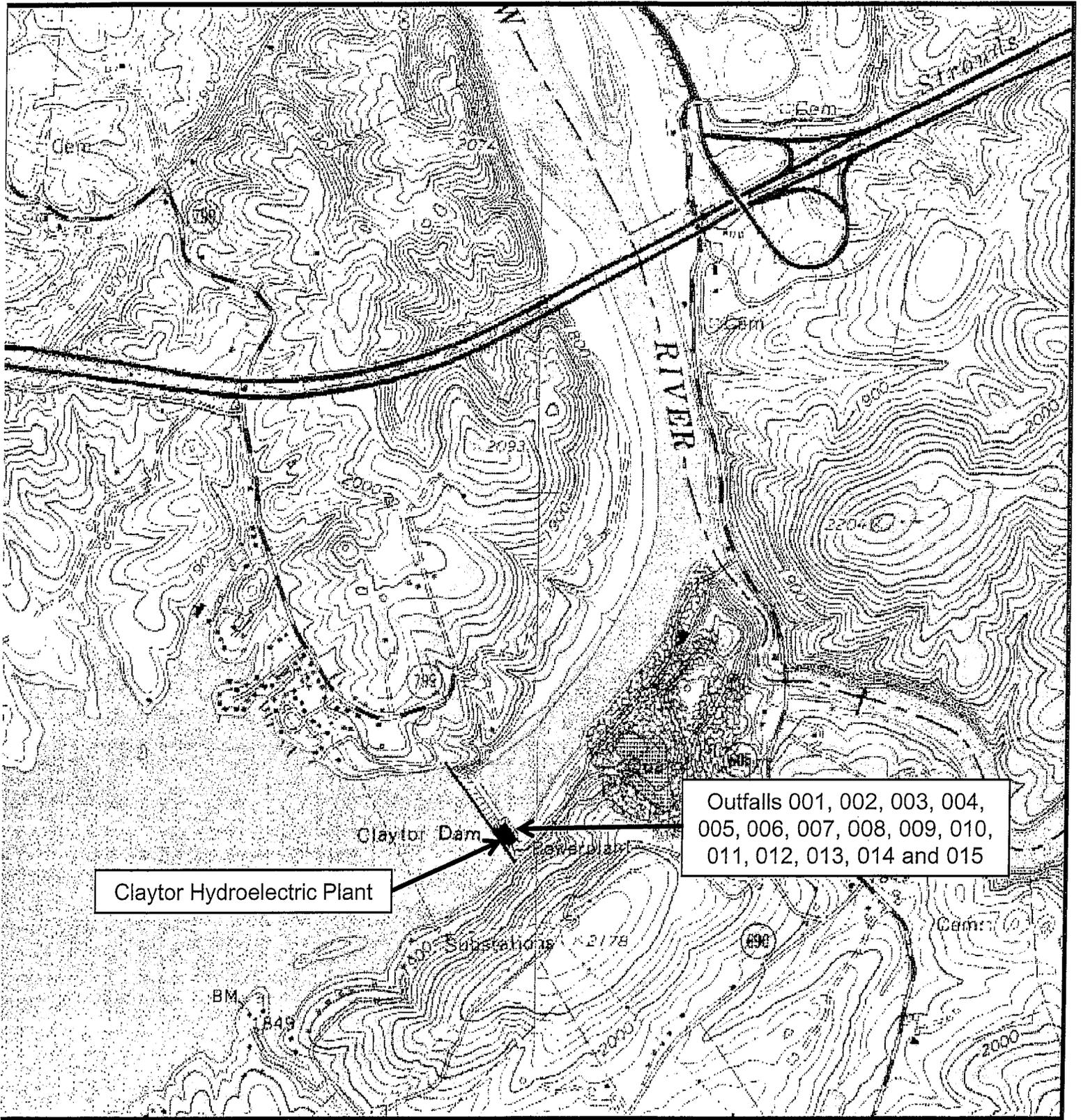
Process Flow Diagram

Outfall Descriptions

Wastewater Processes Descriptions

Site Visit Report

Figure 1



Radford, VA Quadrangle
USGS Topographic Map

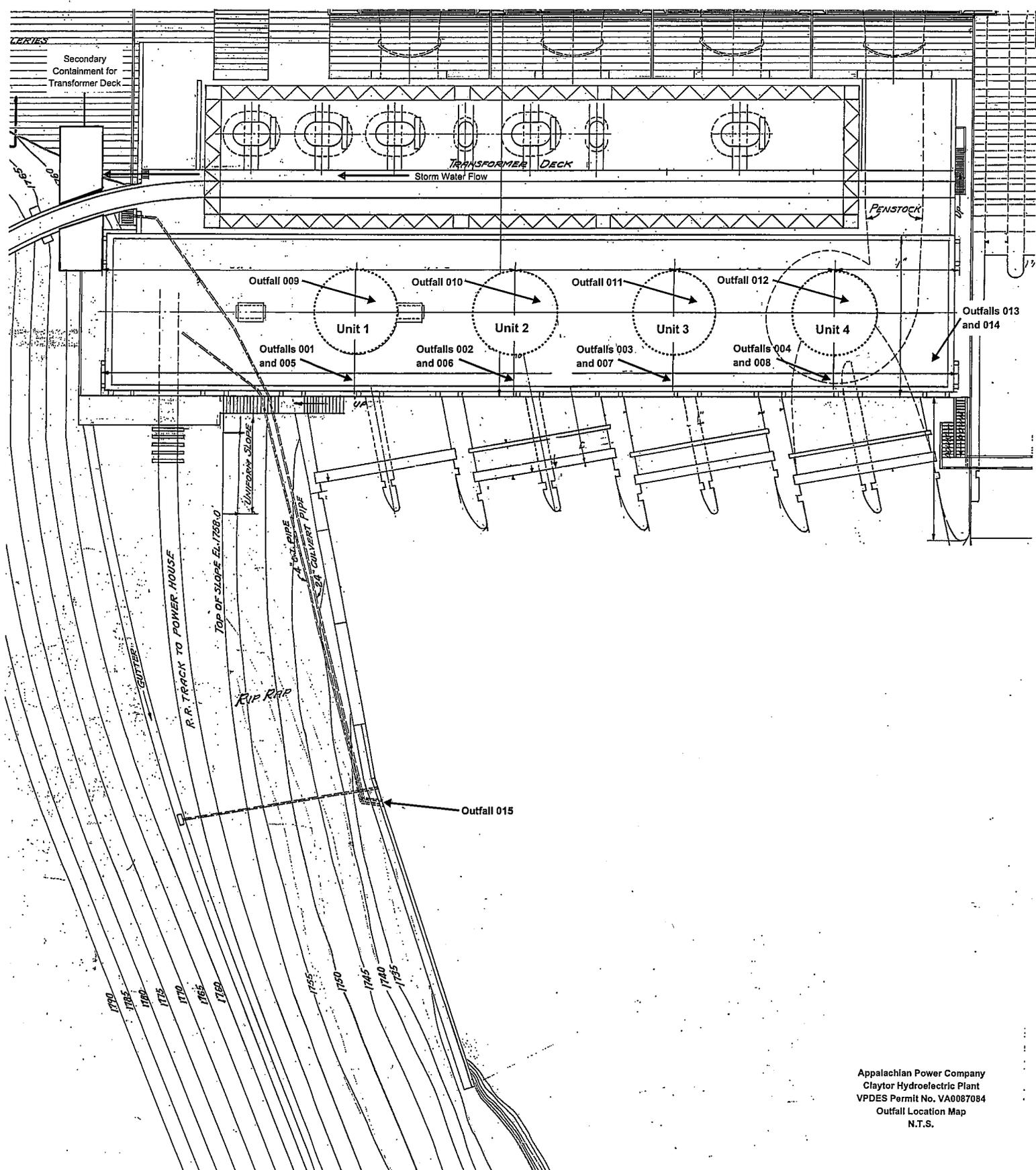


11.22.08

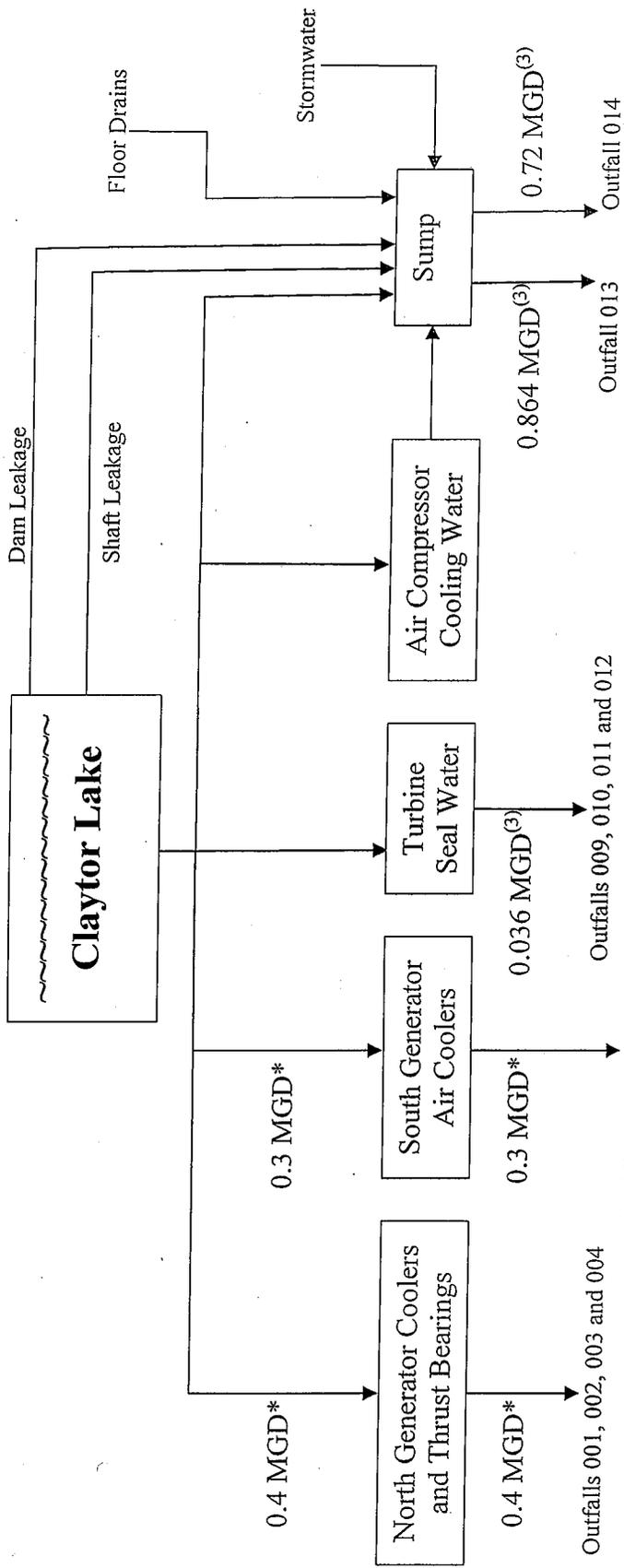
Appalachian Power Company
Claytor Hydroelectric Plant
VPDES Permit VA0087084
USGS Site Topographic Map

Plant Latitude 37° 04' 30"
Plant Longitude 80° 35' 05"





Appalachian Power Company
 Claytor Hydroelectric Plant
 VPDES Permit No. VA0087084
 Outfall Location Map
 N.T.S.



Outfall No.	Receiving Water	Average Flow ⁽¹⁾ (MGD)	Maximum Flow ⁽²⁾ (MGD)
001	New River	0.350	0.407
002	New River	0.356	0.404
003	New River	0.356	0.393
004	New River	0.265	0.426
005	New River	0.322	0.345
006	New River	0.318	0.331
007	New River	0.299	0.331
008	New River	0.308	0.325
009	New River	0.036	0.036 ⁽³⁾
010	New River	0.036	0.036 ⁽³⁾
011	New River	0.036	0.036 ⁽³⁾
012	New River	0.036	0.036 ⁽³⁾
013	New River	0.003	0.864 ⁽³⁾
014	New River	0.004	0.72 ⁽³⁾
015	New River	<0.0001 ⁽⁴⁾	0.388 (25-yr/24-hr storm)

* Typical flows for Units 1 through 4.

⁽¹⁾ Average flow values measured during June 24, 2004 permit monitoring period unless noted otherwise.

⁽²⁾ Maximum flow values measured during June 24, 2004 permit monitoring period unless noted otherwise.

⁽³⁾ Calculated maximum values.

⁽⁴⁾ Under normal operations and dry conditions, there is no flow through Outfall 015 other than dam seepage.

Transformer Deck Stormwater
 0.0 MGD (Normal)
 0.022 MGD (25-year/24-hour storm)

Secondary Containment

Stormwater / Dam Seepage
 0.366 MGD (25-yr/24-hr storm)

Outfall 015

Appalachian Power Company
 Claytor Hydroelectric Plant
 VPDES Permit No. VA0087084
 VPDES Water Balance Diagram
 Date: 11.24.08

I. LIKE OUTFALLS

The Claytor Hydroelectric Plant is made up of four 20-megawatt units that were placed into commercial service in 1939. The units are identical in design and the materials of construction. No one unit is run either more frequently or more consistently than the other three.

The number of discharges designated as outfalls, for the purpose of this permit, is the same for each of the four units. The quantity of water discharged from like systems serving an identical function for each unit should be very similar due to the common water source and unit design.

Consequently, the Company requests that each group of cooling water systems having an identical intake water source be considered like discharges for the purposes of this permit. The Company further requests that the analyses of application samples collected from a discharge within a designated group and included in Part V-A, B, and C be considered representative of all the outfalls within that group. The groups of like outfalls are described below.

Group 1: North Generator Air Coolers/Thrust Bearing Oil Coolers

Designated as Outfalls 001, 002, 003, and 004 for Units 1, 2, 3, and 4, respectively, these discharges are comprised of non-contact cooling water used to cool the north generator coolers and the thrust bearing coolers. The discharges from these two systems are combined and discharged to the tailrace through a single pipe for each unit. The sample results provided in Part V-A, B, and C are based on a sample of Outfall 003, which is considered representative of this group of discharges.

Group 2: South Generator Air Coolers

There are two generator coolers per unit at Claytor Hydroelectric Plant. Influent cooling water to the generator coolers is split with approximately 50% being fed to the south generator coolers, and the other half to the north generator coolers. As described above, the discharge from the north generator coolers on each unit is combined with the thrust bearing cooler effluent prior to discharge. Like the north generator coolers, the effluent from the south generator coolers, designated Outfalls 005, 006, 007, and 008 for Units 1, 2, 3, and 4, respectively, is also a non-contact cooling water used only to reduce the ambient temperature of the generator. These effluents are not combined with any other source prior to their discharge to the tailrace. The sample results provided in Part V-A, B, and C are based on a sample of Outfall 007, which is considered representative of this group of discharges.

Group 3: Turbine Seal Water

Turbine seal water flows by gravity through openings in the upper runner seal to reduce friction caused by the rotation of the water wheel. The water then diffuses through the wicket gates, where it combines with the circulating water used to operate the unit prior to discharge to the tailrace. The turbine seal water discharges are designated as Outfalls 009, 010, 011, and 012 for Units 1, 2, 3, and 4, respectively. The analytical information provided for these outfalls in Part V was estimated directly from the results for the intake sample (see Appendix A, Note 5).

II. FURTHER DESCRIPTION OF OUTFALLS

Outfalls 001, 002, 003, & 004: Combined North Generator Coolers & Thrust Bearing Coolers

As the rotor of each hydroelectric generator turns and creates electrical current in the surrounding coils, heat is generated as a by-product. The generator coolers (two per unit) are situated on each side of the generator to absorb this heat and maintain a cooler air temperature within the generator. The generator coolers are radiator-like devices made up of a series of small steel tubes. Service water from Claytor Lake is passed through these tubes and, as the warm air of the generator passes across the surface of the cooler, the water within absorbs the heat.

The thrust bearings are located at the point where the rotor rests on its support structure, allowing for unencumbered rotation of the shaft. The purpose of the thrust bearing cooler is to lower elevated lubricating oil temperatures caused by friction between the thrust bearing and the rotor. The transfer of heat is accomplished by passing the heated oil over a series of cooling coils containing service water taken from Claytor Lake.

Water leaving the north generator cooler and the thrust bearing cooler combine to form a single discharge from each unit. These discharge points from Units 1, 2, 3, and 4 are designated Outfalls 001, 002, 003, and 004, respectively.

Outfalls 005, 006, 007, & 008: South Generator Coolers

As described above for the north generator coolers, each unit at Claytor Hydroelectric plant has two generator coolers (designated 'north' and 'south') to absorb heat and maintain a cooler air temperature within the generator. Water from the south generator coolers on these units is discharged to the New River through outlet pipes separate from the north generator coolers/thrust bearing coolers. These discharges are designated Outfalls 005, 006, 007, and 008 for Units 1, 2, 3, and 4, respectively.



Note 1: ITEM II, A, B – DISCUSSION OF FLOW FIGURES FROM ITEM II-A (FLOW DIAGRAM) AND ITEM II-B (DESCRIPTION, TREATMENT, SOURCES, ETC.)

The generating scheme at this and other Company hydroelectric plants is determined by a number of factors, the most important of which are availability of water and the system availability of generating units. Therefore, a large number of variables directly impacting these two factors can affect the generating schedule, making it difficult to accurately predict the operating schedule, and thus the flow scheme for a hydroelectric unit based on historical records. Because of this, the average and maximum flow values shown on Figure 3 and average flow values included on Form 2C (Item II-B, Column 2b – Sources), represent the flows measured over the current permit term and would be expected on any given day when all units are operating at full capacity. The use of flow data determined by any other method would restrict the Company's ability to operate the plant at full capacity, thereby derating the capacity of the plant. These figures do not represent maximum design flows, in that, such factors as redundancy and extraordinary operations were not used in the calculation of listed flows, as these are atypical of normal operation. As such, these flows represent the volume of water necessary to operate this plant under normal conditions at full capacity. The Company contends that figures based on any other method of calculation would be misleading and not in keeping with the intent of Form 2C. The flows ascribed to these outfalls were calculated using a combination of intake measurements and engineering estimates based on available system data, as described below.

The reported average and maximum flow values for Outfalls 001, 002, 003, 004, 005, 006, 007, and 008 were collected during the renewal sampling and over the current permit term as reported on the Discharge Monitoring Reports (DMR's) for each respective outfall. As previously discussed, the maximum reported flows values do not represent the absolute maximums that could occur due to unit availability, operations, etc. The flows ascribed to Outfalls 009, 010, 011, and 012 were previously derived using a combination of intake measurements and engineering estimates based on available system data and not expected to have changed.

The average flow value from Outfall 013 (emergency pump) was calculated using the flow values collected during the renewal sampling and those reported on the DMR's over the current permit term, but is typically zero due to the infrequent and atypical nature of the outfall (emergency pump for Outfall 014). The maximum daily flow reported (0.864 MGD) has been estimated based upon the average time necessary to pump the river water trapped behind the exit gates from a single unit during draft tube dewatering. This estimated volume is believed to be accurate for each of the four units, since they are identical in design and materials of construction. This value is designated as the maximum daily flow for this outfall; however, the Company notes that draft tube dewatering may, at times, take longer than 12 hours if there is leakage around the intake or exit gates.

The flow figures for Outfall 014 (sump discharge) are calculated using a combination of time measurements and pump ratings. The average flow value reported was calculated using the flow values collected during the renewal sampling and those reported on the DMR's over the current permit term. The maximum flow listed was calculated using the pump ratings and a constant 24-hour flow. Influent figures for the sump from leakage, floor drainage, and the air compressor could not be measured due to the inaccessibility of their discharge points to the sump.

Outfall 015 discharges stormwater runoff from a 2.7-acre area at the facility. The majority of the drainage area leading to this outfall is a rocky sideslope on the south bank of the New River, immediately south of the powerhouse. A small portion of the drainage area (6,938 ft²) is from the powerhouse roof area referred to as the transformer deck. The Company installed secondary containment in the form of a 25,000-gallon capacity oil/water separator for this roof area. The purpose of the secondary containment is to provide oil containment for the transformer deck in the event of a transformer failure and/or fire that may result in the release of mineral oil. This containment is provided as a preventative measure, since the facility has no history of leaks or spills at this site.

During dry weather, no flow will enter the secondary containment. Transformer deck runoff during a 25 year, 24 hour storm event would total 21,621 gallons per day, which is less than the containment system's storage capacity of 25,000 gallons. In the event of a worst-case catastrophic fire involving two of the main transformers, fire suppression deluge flows would total 1,300 gallons per minute. The deluge water source is the New River.

Note 2: STORMWATER

In addition to the outfalls listed in Parts 1A and 1B of this application, there are, at this facility a number of pipes, culverts, etc., which carry uncontaminated storm water collected from roof and deck drains, yard areas, employee parking lots and other areas not directly associated with the production functions of the plant. The Company submits that these drains do not fit the definition of "discharges associated with industrial activities", therefore, should not be included in this permit. For this reason, these drains were not sampled during permit application preparation, and have not been specifically identified in this application.

Note 3: SCREEN WASH AND LEAKAGE

The intake lines at Claytor Hydroelectric Plant are fitted with filter screens to remove debris from the intake water prior to use. Under normal operating conditions, each of the strainers is cleaned once per year. The accumulated mud and debris removed from the screens is collected and properly disposed of, while the water is directed to the plant sump (see Appendix B, Part II).



Outfalls 009, 010, 011, & 012: Turbine Seal Water

The area that contains the water wheel and directs the incoming water used for generation through the wheel to the tailrace is called the stay ring. As the water wheel turns, the close proximity to the sides of the discharge ring (approximately 0.030 inch) causes a buildup of heat caused by friction. Although some of the incoming water passes through these confined spaces when the unit is generating, the quantity is not enough to provide the cooling and lubrication required, so extra water is piped directly into the area to serve these functions. When the unit is condensing, there is little water from the penstock entering the stay ring, such that this extra water is necessary to maintain unit operation without equipment damage. The water piped into the stay ring to provide cooling and lubrication is called turbine seal water.

Turbine seal water provided to each unit at Claytor Hydroelectric Plant is supplied through two openings in the stay ring, and is discharged to the tailrace below the surface of the New River. As a result, these discharges are inaccessible for sampling. However, since the turbine seal water is cooling water having only minimal contact with the steel water wheel and discharge ring, the quality should not be significantly different between intake and discharge. Outfalls 009, 010, 011, and 012 are designated as the turbine seal water discharge from Units 1, 2, 3, and 4, respectively.

Outfall 013: Emergency Pump Water

The emergency pump at Claytor Hydroelectric Plant is a 40 horsepower sump pump used for dewatering the draft tubes (see Appendix A, Note 4) and for removing excess water from the sump caused by a failure of the primary sump pumps. There will normally be no flow through Outfall 013. Since the major source of water entering the sump and passing through the emergency pump during the dewatering process is river water trapped between the intake and exit gates, water quality should not be significantly different between the intake and discharge.

Outfall 014: Sump

The sump at Claytor Hydroelectric Plant is a collection area for packing water and wicket gate leakage from each of the four units. In addition, water from the pressure relief wells in the plant's lower tunnel, stormwater from certain areas of the powerhouse roof, and screen wash water are also collected and diverted to the sump. Under normal conditions, water is discharged automatically from the sump to the tailrace using two 10 horsepower, 250 gallon per minute sump pumps controlled by mercury float switches. When either of these pumps is used, the effluent is removed through a discharge pipe designated as Outfall 014. In the event of a failure of the primary sump pumps, or during draft tube dewatering (see

Appendix A, Note 4), the emergency pump is used to remove excess water from the sump via Outfall 013.

Outfall 015: Stormwater Outfall

Sources to Outfall 015 consist only of stormwater runoff and a negligible amount of dam seepage. No wastewater sources are directed to the area draining to this discharge under normal plant operation. The stormwater is not exposed to industrial or process-related wastes or raw materials, and there is no reason to believe that the quality of the runoff from this site, including the runoff from the transformer deck, would contain significant concentrations of contaminants.

The discharge of leakage essentially returns water to the New River that has seeped through the dam walls from the forebay and into the inspection tunnels. The amount of leakage is dependent upon temperature, forebay level, and weather conditions. Approximately 50% of the accumulated leakage is diverted from the inspection tunnels to the tailrace and discharged. This discharge does not enter the powerhouse area of the facility, and does not come into contact with any production or process water. The Company does not believe that this water should be regulated in the permit, as it is not a discharge or addition of pollutants to navigable waters, as contemplated by the Clean Water Act, and does not constitute an outfall.

Note 4: DRAFT TUBE DEWATERING

During equipment outages at Claytor Hydroelectric Plant, it is occasionally necessary to dewater the draft tube passages to perform inspection and maintenance of the equipment. Dewatering of the draft tubes is performed by closing the intake and exit gates that allow passage of water through the water wheel, then pumping the water trapped between these gates to the plant sump. In addition to the two primary sump pumps (10 horse power each) used to remove excess water from the sump under normal operating conditions, an additional 50 horsepower emergency pump is employed, during dewatering, to reduce retention time and minimize the possibility of overflows. This excess water is discharged to the tailrace via Outfall 013. Draft tube dewatering is performed at this plant on an "as needed" basis, but under normal conditions would not exceed once per unit per year. The influx of water from the dewatering process has very little retention time in the sump, and should have a limited effect on discharge water quality.

Note 5: ESTIMATION OF DATA IN PART V-A, B, AND C FOR OUTFALLS 009, 010, 011, 012 (TURBINE SEAL WATER), AND PART VII-A FORM 2F FOR 015 (STORMWATER RUNOFF)

Outfalls 009, 010, 011 and 012 directly discharge through the turbine blades into the tailrace. As a result, these discharge points are inaccessible for sampling. As described in Appendix B, the turbine seal water does not contact any plant processes or process waters, such that, there is no reason to believe that any contaminants are present in these discharges other than those that are present in the influent. Consequently, the estimates of chemical concentrations provided in Part V-A, B, and C were derived directly from concentrations measured in the intake water when application sampling was performed.

Stormwater samples at Outfall 015 were collected during a qualifying storm event and the resulting chemical concentrations are provided in Part VII-A on Form 2F. As discussed in Appendix B, Outfall 015 consists only of stormwater runoff and a negligible amount of dam seepage. No wastewater sources are directed to the area draining to this discharge under normal plant operation. The stormwater is not exposed to industrial or process-related wastes or raw materials, and there is



no reason to believe that the quality of the runoff from this site, including the runoff from the transformer deck, would contain significant concentrations of contaminants. As such, no monitoring of Outfall 015 should be required.

Note 6: REQUEST FOR REPRESENTATIVE SAMPLING OF LIKE OUTFALLS

The DMR data summarized in Appendix D demonstrates that the discharges from Claytor Hydroelectric Plant contribute negligible warming to the New River downstream of the facility, and have no reasonable potential to cause an exceedance of the New River temperature standard of 29 °C. The highest measured temperature for any outfall over the present term of Claytor Hydroelectric Plant's current permit was 24.4 °C at Outfall 014 (measured during the July 1, 2006 to June 30, 2007 monitoring period), which is more than 4 C° below the standard. In addition, at the New River 7Q10 flow at the plant of 462 MGD, the maximum flow of 4.69 MGD (sum of all maximum flows measured over the current permit term) from all facility outfalls combined would have to undergo an inconceivable temperature rise of more than 10 C° to produce a change of 0.1 C° in the ambient river temperature. Based on this information, the Company submits that sampling of one outfall from each group of like outfalls will provide sufficient evidence of continued compliance with the temperature standard.

As detailed in Appendix B, there are three groups of like outfalls at Claytor Hydroelectric Plant, two of which are currently sampled for VPDES compliance monitoring. Group 1 consists of the north generator air coolers and thrust bearing oil coolers for Units 1, 2, 3, and 4, which discharge via Outfalls 001, 002, 003, and 004, respectively. Group 2 consists of the south generator air coolers for Units 1, 2, 3, and 4, which discharge via Outfalls 005, 006, 007, and 008, respectively. The systems represented by these two groups are identical in design and materials of construction for each of the four turbine units, resulting in discharge flows and temperature readings that are virtually identical, as shown in the summary table below using the data from Appendix D.

Mean of Monthly DMR Data, 8/2004 – 6/2008 (n = 4)		
Outfall	Flow (MGD)	Temperature (°C)
001	0.350	16.2
002	0.356	15.9
003	0.365	16.2
004	0.265	21.2
005	0.322	16.2
006	0.318	15.7
007	0.301	16.7
008	0.308	21.3

Based on this discussion, the Company requests that future compliance monitoring be required for one outfall from each of the two cooling water groups.



water groups. Based on the slightly higher mean temperatures for the Unit 4 outfalls, appropriate designated outfalls for each group would be Outfalls 004 and 008.

Note 7: REQUEST FOR ELIMINATION OF pH MONITORING ON OUTFALLS 013 AND 014

The pH monitoring data for Outfalls 013 and 014 have demonstrated consistent compliance with the 6.0 – 9.0 acceptable range. The actual range measured in monthly samples over the term of the present permit is 7.71 – 8.20 for Outfall 013, and 7.29 – 7.94 for Outfall 014. The Company submits that the monitoring for pH on these discharges is no longer warranted, and we request that it be eliminated, for the following reasons:

- There are no chemical additives to the plant sumps, the overflow from which comprise Outfalls 013 and 014, nor to any of the sources to the sumps.
- The sources to the plant sumps are floor drains, dam or turbine shaft leakage, and draft tube dewatering. These sources are essentially pass-through of New River water, such that there is no reasonable potential for a significant change in pH of the water.
- Since the permit's effective date (May 27, 1994), these discharges have had no exceedances of pH effluent limitations, with the exception of one questionable measurement of 9.02 on Outfall 013 in September 1994.
- Years of pH compliance data collected at similar sump discharges at the Company's other Virginia hydroelectric plants affirm that violations of pH water quality standards are not likely to occur from these discharges.

MEMORANDUM

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
BLUE RIDGE REGIONAL OFFICE
3019 Peters Creek Road
Roanoke, Virginia 24019-2738

Subject: AEP Claytor Hydroelectric Plant – VPDES Permit VA0087084
Site Visit for Permit Reissuance

To: Permit file

From: Bob Tate, Water Permit Writer *RST*

Date: February 19, 2009

AEP's Claytor Hydroelectric Plant was visited for VPDES permit reissuance on Wednesday morning February 18. Present were Charlie Burnett and Jon Magalski of AEP and Bob Tate of DEQ. Mr. Burnett conducted the site visit.

The facility contains four identical 20 megawatt hydroelectric generating units. Unit 1 is associated with outfalls 001, 005 and 009. Unit 2 is associated with outfalls 002, 006 and 010. Unit 3 is associated with outfalls 003, 007 and 011. Unit 4 is associated with outfalls 004, 008 and 012. Unit 4 was out of service at the time of the site visit.

River water is drawn through an intake 80 feet below the lake surface. Debris is removed from the river water by one of two twin 3/32" mesh basket screens. Screens are cleaned by reversing flow direction through the screens.

Outfalls 001, 002, 003, and 004 discharge non-contact cooling water from the north generator coolers and thrust bearing coolers. Outfalls 005, 006, 007, and 008 discharge non-contact cooling water from the south generator coolers. These effluents are not combined with any other discharges prior to entering the tailrace. Outfalls 009, 010, 011, and 012 discharge turbine seal water, which does not contact any plant process or process water prior to discharge in the tailrace. Discharges through these outfalls are essentially intake water. There is no mechanism for sampling Outfalls 009, 010, 011, and 012. These outfalls are identified in the current permit but without limits and monitoring. Consideration should be given to removing Outfalls 009-012 from the permit and describing them in the fact sheet as point sources. Outfalls 001-012 have a common water source. Outfall 013 is the discharge point utilized during draft tube dewatering. During draft tube dewatering, excess water is pumped from the main sump by a 50-hp pump. Normally there is no discharge through 013, although the main sump can be emptied through 013 should the two main sump pumps fail. Outfall 014 is the main sump discharge point, and is operated utilizing two 10-hp pumps. The main sump is a collection area for packing water and wicket gate leakage from each of the four units. The sump also collects water from the pressure relief wells in the plant's lower tunnel, storm water from certain areas of the power house roof, dam leakage, supernatant from intake screen cleaning, air compressor blowdown, floor drains, and air compressor blowdown. Scum and oil is removed from this effluent stream with absorbent pillows, drum separators, manual vacuuming, and a new oil skimmer. Collected scum and oil are stored in drums and taken offsite for treatment and disposal. Outfall 015 discharges storm water from the transformer deck along with a negligible amount of dam seepage. On the transformer deck, the only "industrial activity" that appears to be exposed to storm water is a tarp-covered 200 gallon diesel fuel tank that is provided with secondary

containment. Walls on either side of the transformer deck restrict storm water run-on. Storm water from the transformer deck flows into a 25,000 gallon oil-water separator tank before being released to Outfall 015. The oil-water separator was installed for secondary containment purposes for the transformer deck per the SPCC rules. The writer thinks that “No exposure certification to industrial storm water” is a viable option.

The facility appeared to be clean and well maintained. A centrifugal purification unit allows petroleum-base hydraulic oil to be reused. Oils and fuels are unlikely to reach the receiving stream (New River) due to storage containers and handling procedures.

Discharge of treated domestic sewage is covered by registration with the VPDES general permit for domestic facilities producing less than 1,000 gallons a day.

APPENDIX B

RECEIVING STREAM INFORMATION

Flow Frequency Memoranda

February 24, 2009

May 12, 2004

2008 Impaired Water Fact Sheet

STORET Data for WQC/WLA spreadsheets' statistics

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
Blue Ridge Regional Office
3019 Peters Creek Road Roanoke, Virginia 24019

SUBJECT: Flow Frequency Determination
AEP Claytor Hydroelectric Plant VA0087084

TO: Permit File

FROM: Bob Tate, water permit writer *RST*

DATE: February 24, 2009

This memo is an update of the previous flow frequency determination memo from Jason Winningham dated May 12, 2004 concerning the subject VPDES permit.

The AEP Claytor Hydroelectric Plant discharges via numerous outfalls located at the base of the Claytor Lake Dam on the New River near Radford, VA. Stream flow frequencies are required at this site for use in developing effluent limitations for the VPDES permit.

The Claytor Lake Dam is governed by a 401 certificate which states that the minimum daily release must not be less than the 7Q10 when inflows to the lake are greater than the 7Q10 and equal to the inflow when the inflow is less than the 7Q10.

The USGS operated a continuous record gage on the New River at Radford, VA (#03171000) since 1940. The gage is located downstream of the Claytor Lake dam at the U.S. Highway 11 bridge in Radford, VA. The flow frequencies for the gage are based on the regulated period of record.

The Little River enters the New River between the gage and the dam. The flow contributed by the 351 mi² drainage area of the Little River were subtracted from the Radford gage flows. The Little River flow frequencies were determined using the gage on the Little River at Graysonton, VA (#03170000).

The values at the discharge point were determined by projecting the flow frequencies for the New River at the Radford gage to the dam using drainage area proportions and then subtracting the Little River flows. The flow through the dam was then assigned to the discharge point. This analysis does not address any withdrawals, discharges, or springs lying between the dam and the Radford gage.

Flow Frequency Memorandum
Claytor Hydroelectric Plant
VA0087084

New River at Radford, VA (#03171000):

Drainage Area = 2748 mi²

1Q30 = 678 cfs	
1Q10 = 719 cfs	High Flow 1Q10 = 840 cfs
7Q10 = 887 cfs	High Flow 7Q10 = 1210 cfs
30Q10 = 1020 cfs	High Flow 30Q10 = 1660 cfs
30Q5 = 1140 cfs	Harmonic Mean = 2350 cfs

New River at mouth of Little River:

Drainage Area = 2382 mi²

1Q30 = 588 cfs	
1Q10 = 623 cfs	High Flow 1Q10 = 728 cfs
7Q10 = 769 cfs	High Flow 7Q10 = 1049 cfs
30Q10 = 884 cfs	High Flow 30Q10 = 1439 cfs
30Q5 = 988 cfs	Harmonic Mean = 2037 cfs

Little River at Graysonton, VA (#03170000):

Drainage Area = 300 mi²

1Q30 = 48 cfs	
1Q10 = 60 cfs	High Flow 1Q10 = 88 cfs
7Q10 = 66 cfs	High Flow 7Q10 = 110 cfs
30Q10 = 86 cfs	High Flow 30Q10 = 155 cfs
30Q5 = 100 cfs	Harmonic Mean = 227 cfs

Little River at mouth:

Drainage Area = 351 mi²

1Q30 = 56 cfs	
1Q10 = 70 cfs	High Flow 1Q10 = 103 cfs
7Q10 = 77 cfs	High Flow 7Q10 = 129 cfs
30Q10 = 101 cfs	High Flow 30Q10 = 181 cfs
30Q5 = 117 cfs	Harmonic Mean = 266 cfs

Subtracting the Little River flows from the New River flows at the mouth of the Little River and then assigning the flows at the dam to the discharge points;

New River at discharge point (dam):

1Q30 = 532 cfs = 343 MGD	
1Q10 = 553 cfs = 357 MGD	High Flow 1Q10 = 625 cfs = 404 MGD
7Q10 = 692 cfs = 447 MGD	High Flow 7Q10 = 920 cfs = 594 MGD
30Q10 = 784 cfs = 506 MGD	High Flow 30Q10 = 1258 cfs = 812 MGD
30Q5 = 871 cfs = 563 MGD	Harmonic Mean = 1771 cfs = 1144 MGD

The high flow months are January through May.

Flow frequencies for the gage sites (#03171000 and #03170000) were compiled in 2005.

Attached is a spreadsheet printout that shows calculated flow frequencies at the points of interest.

SITE	DAAREA	CALCULATION	HARMEAN	HF30Q10	HF7Q10	HF1Q10	Z30G5	Z30Q10	Z7Q10	Z1Q10	Z1Q30	FLOW UNIT
New River at Radford, Va.	2748	A	2350	1660	1210	840	1140	1020	887	719	678	cfs
New River at mouth of Little River	2382	B = 2382/2748 A	2037	1439	1049	728	988	884	769	623	588	cfs
Little River near Graysonton, Va.	300	C	227	155	110	88	100	86	66	60	48	cfs
Little River at mouth	351	D = 351/300 C	266	181	129	103	117	101	77	70	56	cfs
(cfs)		E = B - D	1771	1258	920	625	871	784	692	553	532	cfs
(MGD)		F = 0.646 E	1144	812	594	404	563	506	447	357	343	MGD

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
West Central Regional Office
3019 Peters Creek Road Roanoke, Virginia 24019

SUBJECT: Flow Frequency Determination
AEP Claytor Hydroelectric Plant VA0087084

FROM: Jason Winningham, WCRO 

DATE: May 12, 2004

This memo is an update of the previous flow frequency determination memo from Paul Herman dated January 5, 1999 concerning the subject VPDES permit.

The AEP Clay Hydroelectric Plant discharges to via numerous outfalls located at the base of the Claytor Lake Dam on the New River near Radford, VA. Stream flow frequencies are required at this site for use in developing effluent limitations for the VPDES permit.

The Claytor Lake dam is governed by a 401 certificate which states that the minimum daily release must not be less than the 7Q10 when inflows to the lake are greater than the 7Q10 and equal to the inflow when the inflow is less than the 7Q10.

The USGS operated a continuous record gage on the New River at Radford, VA (#03171000) since 1940. The gage is located downstream of the Claytor Lake dam at the U.S. Highway 11 bridge in Radford, VA. The flow frequencies for the gage are based on the regulated period of record.

The Little River enters the New River between the gage and the dam. The flow contributed by the 351 mi² drainage area of the Little River were subtracted from the Radford gage flows. The Little River flow frequencies were determined using the gage on the Little River at Graysonton, VA (#03170000).

The values at the discharge point were determined by projecting the flow frequencies for the New River at the Radford gage to the dam using drainage area proportions and then subtracting the Little River flows. The flow through the dam was then assigned to the discharge point. This analysis does not address any withdrawals, discharges, or springs lying between the dam and the Radford gage.

Flow Frequency Memorandum - May 12, 2004
Claytor Lake Hydroelectric Plant
VA0087084

New River at Radford, VA (#03171000):

Drainage Area = 2,748 mi²

1Q10 = 465 MGD	High Flow 1Q10 = 550 MGD
7Q10 = 589 MGD	High Flow 7Q10 = 803 MGD
30Q5 = 754 MGD	HM = 1530 MGD
30Q10 = 687 MGD	

New River at Claytor Lake dam (with Little River contribution):

Drainage Area = 2,382 mi²

1Q10 = 403 MGD	High Flow 1Q10 = 476 MGD
7Q10 = 511 MGD	High Flow 7Q10 = 696 MGD
30Q5 = 654 MGD	HM = 1326 MGD
30Q10 = 595 MGD	

Little River at Graysonton, VA (#03170000):

Drainage Area = 300 mi²

1Q10 = 41 MGD	High Flow 1Q10 = 58 MGD
7Q10 = 46 MGD	High Flow 7Q10 = 71 MGD
30Q5 = 66 MGD	HM = 149 MGD
30Q10 = 58 MGD	

Little River at mouth:

Drainage Area = 351 mi²

1Q10 = 48 MGD	High Flow 1Q10 = 67 MGD
7Q10 = 54 MGD	High Flow 7Q10 = 84 MGD
30Q5 = 78 MGD	HM = 174 MGD
30Q10 = 68 MGD	

Subtracting the Little River flows from the New River flows at the dam and assigning the flows at the dam to the discharge points;

New River at discharge point:

1Q10 = 356 MGD	High Flow 1Q10 = 409 MGD
7Q10 = 457 MGD	High Flow 7Q10 = 612 MGD
30Q5 = 576 MGD	HM = 1152 MGD
30Q10 = 527 MGD	

The high flow months are January through May.



2008 Impaired Waters

Categories 4 and 5 by Basin & Stream Name

New River Basin

Cause Group Code: N29R-01-PCB New River, Claytor Lake, Peak Creek and Reed Creek

Location: The impairment begins at the I-77 bridge crossing the New River and extends downstream to the VA/WVA State Line and includes the tributaries Peak Creek and Reed Creek as described below.

City / County: Giles Co. Montgomery Co. Pulaski Co. Radford City

Use(s): Fish Consumption

Cause(s) /

VA Category: PCB in Fish Tissue/ 5A

The Virginia Department of Health (VDH) issued a fish consumption advisory on August 6, 2001 for polychlorinated biphenyls (PCBs) for the lower portion of the New River (Rt. 114 Bridge downstream to the VA / WVA State Line - 52.0 miles) based on fish tissue collections from Carp. An Advisory extension to Claytor dam was issued 8/06/2003 (11.47 miles) recommends that no carp be consumed in these waters and no more than two meals per month of flathead and channel catfish. The VDH PCB Fish Consumption Advisory was further extended upstream on the New River (13 miles) to the I-77 Bridge to include the lower portions of Peak Creek (4.95 miles), Reed Creek (16.35 miles) and Claytor Lake (4,287 acres) on 12/02/2004. The VDH advises consumption should not exceed two meals per month for carp and smallmouth bass. The VDH level of concern is 50 parts per billion (ppb) in fish tissue.

There are eight fish tissue collection sites within the 2008 data window reporting exceedences of the WQS based 54 ppb fish tissue value (TV). These data are reviewed by the VDH in making an advisory determination. A complete listing of collection sites and associated fish tissue data are available at <http://www.deq.virginia.gov/fishtissue/fishtissue.html>. A more detailed presentation of the data can also be found using an interactive mapping application at <http://gisweb.deq.state.va.us/>. The VDH Advisory information is also available via the web at <http://www.vdh.virginia.gov/Epidemiology/PublicHealthToxicology/Advisories/>.

New River, Claytor Lake, Peak Creek and Reed Creek	Estuary (Sq. Miles)	Reservoir (Acres)	River (Miles)
Fish Consumption			
PCB in Fish Tissue - Total Impaired Size by Water Type:		4,286.76	68.14

Sources:

Source Unknown

*Narrative descriptions, Location and City/County describes the entire extent of the Impairment. Sizes may not represent the total overall size of the impairment in terms of stream name only.

WQC/WLA Spreadsheet Statistics
TOTAL HARDNESS as CaCO₃ in mg/L

Collection_Date_Time	Value
6/12/03 9:00	103
4/10/03 9:30	178
3/10/03 12:30	91.4
2/11/03 8:55	73.4
1/22/03 14:15	93.8
12/12/02 14:15	69.1
11/20/02 12:30	106
10/31/02 9:20	68.7
9/19/02 9:45	101
8/20/02 9:30	62.1
7/30/02 10:50	74.5
6/25/02 8:30	79.2
5/30/02 9:15	89.3
4/30/02 10:30	81.2
3/18/02 13:00	109
2/25/02 14:00	47
1/23/02 10:05	67.8
12/18/01 13:30	44.5
11/27/01 12:00	68.5
10/25/01 13:50	40.1
9/11/01 9:30	57.6
8/15/01 12:50	68.9
7/17/01 10:30	52.1
6/25/01 8:30	114
5/17/01 9:00	112
4/10/01 10:15	73.4
3/8/01 10:00	28.1
2/6/01 11:00	155
1/17/01 11:30	75.3
12/27/00 13:00	65.4
11/29/00 10:30	63.3
10/18/00 10:00	83.4
9/19/00 9:00	75.9
8/16/00 13:35	72.4
7/26/00 9:40	72.6
6/26/00 9:35	62
5/24/00 9:05	92
4/6/00 9:15	59
3/29/00 12:00	61
2/14/00 9:00	60.9
1/26/00 9:15	65.1
12/14/99 9:30	54.2
11/16/99 9:10	69.6
10/13/99 8:31	75.2
9/21/99 9:25	59.3
8/17/99 9:25	69.6
7/26/99 9:30	77
6/22/99 8:40	78
5/10/99 8:20	62
4/26/99 8:50	126
3/30/99 9:05	60
2/10/99 8:10	76
1/28/99 8:15	154
12/8/98 9:30	62
11/17/98 9:15	65
10/20/98 9:30	92
9/1/98 9:35	59.5
8/12/98 11:00	83.3
7/28/98 9:30	68.7
6/4/98 8:10	78.2
5/11/98 10:00	128
4/15/98 8:50	81
3/19/98 8:15	102
2/12/98 9:00	91
1/22/98 8:30	62.4
12/2/97 9:00	74

11/4/97 12:15	57.3
10/20/97 10:10	67.8
9/25/97 8:45	50.4
8/25/97 9:20	64.1
7/9/97 10:10	59.3
6/11/97 9:00	64.2
5/28/97 8:25	48.2
4/16/97 9:55	86.8
3/25/97 8:40	84.6
2/12/97 9:45	77.2
1/22/97 8:30	57.7
12/18/96 9:10	74
11/13/96 12:00	50
10/15/96 9:05	85
9/19/96 9:30	90
8/19/96 9:35	66
7/16/96 10:10	64
6/12/96 10:00	36
5/14/96 11:00	36
4/15/96 8:05	86
3/14/96 9:45	82
2/22/96 8:05	86
1/4/96 9:00	50
12/4/95 9:10	45
11/13/95 9:30	54
10/11/95 8:25	62
9/13/95 9:25	66
8/9/95 8:50	61
7/13/95 8:45	88
6/21/95 9:35	96
5/24/95 8:20	73
4/20/95 8:25	88
3/29/95 10:35	84
2/27/95 9:55	65
1/24/95 9:30	45
12/21/94 10:30	40
12/7/94 10:05	46
11/3/94 9:50	46
10/11/94 10:00	57
9/28/94 10:30	62
8/4/94 9:35	70
7/7/94 10:00	70
6/7/94 10:00	97
5/3/94 9:15	93
4/7/94 9:20	101
3/28/94 9:10	176
2/3/94 9:15	118
1/26/94 10:10	82
12/2/93 13:15	72
11/1/93 9:20	74
10/12/93 9:20	90
9/1/93 9:35	72
8/2/93 9:45	76
7/7/93 9:15	78
mean hardness	76

Station_ID 9-NEW081.72
 Station_Description Rt. 11 Bridge at Radford
 Latitude 37-8-19
 Longitude 80-34-30
 Stream_Name New River
 Watershed_Code VAW-N18R

WQC/WLA Spreadsheet Statistics

Temperature in °C

temp	Collection_Date_Time	temp
5.9	3/5/08 11:00	5.9
5.6	1/23/08 10:30	5.6
9.7	11/29/07 10:30	
22.2	9/27/07 10:00	
23.1	7/17/07 12:15	
14.8	5/9/07 12:25	14.8
8.8	3/20/07 9:15	8.8
7.1	1/17/07 12:15	7.1
6.2	12/14/06 9:30	
18.9	10/5/06 9:30	
23.2	8/14/06 10:45	
17.6	6/8/06 9:50	
9.2	4/6/06 9:00	9.2
5.1	2/21/06 10:00	5.1
5.4	12/19/05 10:45	
13.1	10/27/05 9:40	
24	8/10/05 10:00	
17.7	6/7/05 10:00	
12.08	4/19/05 9:10	12.08
4.63	2/17/05 9:30	4.63
11.11	12/1/04 10:30	
14.3	10/27/04 9:45	
23.3	8/25/04 12:30	
20.9	6/22/04 9:30	
13.73	4/21/04 15:55	13.73
5.14	2/18/04 10:15	5.14
8.2	12/22/03 10:30	
14.41	10/27/03 13:00	
17.26	6/12/03 9:00	
10.56	4/10/03 9:30	10.56
8.27	3/10/03 12:30	8.27
3.1	2/11/03 8:55	3.1
4.93	1/22/03 14:15	4.93
7.02	12/12/02 14:15	
10.55	11/20/02 12:30	
13.2	10/31/02 9:20	
21.75	9/19/02 9:45	
22.9	8/20/02 9:30	
23.08	7/30/02 10:50	
19.79	6/25/02 8:30	
16.98	5/30/02 9:15	16.98
13.59	4/30/02 10:30	13.59
8.5	3/18/02 13:00	8.5
8.1	2/25/02 14:00	8.1
6	1/23/02 10:05	6
10.6	12/18/01 13:30	
17.5	10/25/01 13:50	
21.4	9/11/01 9:30	
22.1	8/15/01 12:50	

21.8	7/17/01 10:30	
17.3	6/25/01 8:30	
13.5	5/17/01 9:00	13.5
13.1	4/10/01 10:15	13.1
6.1	3/8/01 10:00	6.1
8.2	2/6/01 11:00	8.2
3.3	1/17/01 11:30	3.3
6.5	12/27/00 13:00	
8.5	11/29/00 10:30	
16.2	10/18/00 10:00	
19.1	9/19/00 9:00	
23.7	8/16/00 13:35	
20.6	7/26/00 9:40	
20.9	6/26/00 9:35	
16.3	5/24/00 9:05	16.3
10.6	4/6/00 9:15	10.6
11.4	3/29/00 12:00	11.4
4.3	2/14/00 9:00	4.3
1.9	1/26/00 9:15	1.9
9	11/16/99 9:10	
16.9	10/13/99 8:31	
19.1	9/21/99 9:25	
23	8/17/99 9:25	
22.5	7/26/99 9:30	
18.5	6/22/99 8:40	
13.8	5/10/99 8:20	13.8
12.5	4/26/99 8:50	12.5
8.1	3/30/99 9:05	8.1
6.3	2/10/99 8:10	6.3
6.4	1/28/99 8:15	6.4
12.4	12/8/98 9:30	
12.8	11/17/98 9:15	
17.1	10/20/98 9:30	
23.3	9/1/98 9:35	
23.4	8/12/98 11:00	
23.4	7/28/98 9:30	
19	6/4/98 8:10	
14.1	5/11/98 10:00	14.1
12.4	4/15/98 8:50	12.4
23.0		13.9

90% annual temperature

90% wet season temperature

wet season: January-May

Station_ID: 9-NEW081.72

Station_Description: Rt. 11 Bridge at Radford

Latitude: 37-8-19

Longitude: 80-34-30

Stream_Name: New River

Watershed_Code: VAW-N18R

WQC/WLA Spreadsheet Statistics
pH in SU

Collection_Date_Time	
3/5/08 11:00	8.1
1/23/08 10:30	8
11/29/07 10:30	8.1
9/27/07 10:00	8.2
7/17/07 12:15	7.7
5/9/07 12:25	8.3
3/20/07 9:15	8.2
1/17/07 12:15	8
12/14/06 9:30	8.2
10/5/06 9:30	7.2
8/14/06 10:45	7.6
6/8/06 9:50	7
4/6/06 9:00	6.8
2/21/06 10:00	7.8
12/19/05 10:45	7.5
10/27/05 9:40	7.8
8/10/05 10:00	7.2
6/7/05 10:00	7.8
4/19/05 9:10	8.11
2/17/05 9:30	8.06
12/1/04 10:30	7.45
10/27/04 9:45	7.1
8/25/04 12:30	7.63
6/22/04 9:30	7.47
4/21/04 15:55	7.59
2/18/04 10:15	7.75
12/22/03 10:30	7.6
10/27/03 13:00	7.72
6/12/03 9:00	7.79
4/10/03 9:30	8.12
3/10/03 12:30	7.93
2/11/03 8:55	8.23
1/22/03 14:15	8.05
12/12/02 14:15	7.64
11/20/02 12:30	7.6
10/31/02 9:20	7.13
9/19/02 9:45	7.61
8/20/02 9:30	7.23
7/30/02 10:50	7.23
6/25/02 8:30	7.28
5/30/02 9:15	7.58
4/30/02 10:30	7.72
3/18/02 13:00	8.09
2/25/02 14:00	8.24
1/23/02 10:05	8.01
12/18/01 13:30	8.48
10/25/01 13:50	8.33
9/11/01 9:30	7.72
8/15/01 12:50	7.61

7/17/01 10:30	8.1
6/25/01 8:30	7.27
5/17/01 9:00	8.09
4/10/01 10:15	7.89
3/8/01 10:00	8.49
2/6/01 11:00	8.4
1/17/01 11:30	8.21
12/27/00 13:00	8.3
11/29/00 10:30	8.01
10/18/00 10:00	7.71
9/19/00 9:00	7.49
8/16/00 13:35	7.63
7/26/00 9:40	7.55
6/26/00 9:35	7.68
5/24/00 9:05	7.9
4/6/00 9:15	7.99
3/29/00 12:00	7.94
2/14/00 9:00	7.61
1/26/00 9:15	7.52
11/16/99 9:10	7.51
10/13/99 8:31	7.84
9/21/99 9:25	7.9
8/17/99 9:25	7.71
7/26/99 9:30	7.9
6/22/99 8:40	7.92
5/10/99 8:20	8.2
4/26/99 8:50	8.18
3/30/99 9:05	8.51
2/10/99 8:10	8.16
1/28/99 8:15	7.89
12/8/98 9:30	7.38
11/17/98 9:15	7.78
10/20/98 9:30	7.98
9/1/98 9:35	7.73
8/12/98 11:00	7.79
7/28/98 9:30	7.78
6/4/98 8:10	7.84
5/11/98 10:00	8.04
4/15/98 8:50	7.71
90% maximum pH	8.2
10% maximum pH	7.3
minimum pH	6.8
maximum pH	8.5

Station_ID 9-NEW081.72
 Station_Description Rt. 11 Bridge at Radford
 Latitude 37-8-19
 Longitude 80-34-30
 Stream_Name New River
 Watershed_Code VAW-N18R

WQC/WLA Spreadsheet Statistics

Collection_Date_Time	Parameter_Code	Parameter_Name	Value
		AMMONIA	0.02
12/14/06 9:30	610	NH3+NH4-N TOTAL MG/L	0.04
10/5/06 9:30	610	NH3+NH4-N TOTAL MG/L	0
8/14/06 10:45	610	NH3+NH4-N TOTAL MG/L	0
6/8/06 9:50	610	NH3+NH4-N TOTAL MG/L	0.13
4/6/06 9:00	610	NH3+NH4-N TOTAL MG/L	0
2/21/06 10:00	610	NH3+NH4-N TOTAL MG/L	0
12/19/05 10:45	610	NH3+NH4-N TOTAL MG/L	0.04
10/27/05 9:40	610	NH3+NH4-N TOTAL MG/L	0
8/10/05 10:00	610	NH3+NH4-N TOTAL MG/L	0
6/12/03 9:00	610	NH3+NH4-N TOTAL MG/L	0
4/10/03 9:30	610	NH3+NH4-N TOTAL MG/L	0
3/10/03 12:30	610	NH3+NH4-N TOTAL MG/L	0.05
2/11/03 8:55	610	NH3+NH4-N TOTAL MG/L	0
1/22/03 14:15	610	NH3+NH4-N TOTAL MG/L	0
12/12/02 14:15	610	NH3+NH4-N TOTAL MG/L	0
11/20/02 12:30	610	NH3+NH4-N TOTAL MG/L	0.05
10/31/02 9:20	610	NH3+NH4-N TOTAL MG/L	0.05
9/19/02 9:45	610	NH3+NH4-N TOTAL MG/L	0.05
8/20/02 9:30	610	NH3+NH4-N TOTAL MG/L	0.06
7/30/02 10:50	610	NH3+NH4-N TOTAL MG/L	0
6/25/02 8:30	610	NH3+NH4-N TOTAL MG/L	0
5/30/02 9:15	610	NH3+NH4-N TOTAL MG/L	0
4/30/02 10:30	610	NH3+NH4-N TOTAL MG/L	0
3/18/02 13:00	610	NH3+NH4-N TOTAL MG/L	0.04
2/25/02 14:00	610	NH3+NH4-N TOTAL MG/L	0
1/23/02 10:05	610	NH3+NH4-N TOTAL MG/L	0
12/18/01 13:30	610	NH3+NH4-N TOTAL MG/L	0
11/27/01 12:00	610	NH3+NH4-N TOTAL MG/L	0.06
10/25/01 13:50	610	NH3+NH4-N TOTAL MG/L	0
9/11/01 9:30	610	NH3+NH4-N TOTAL MG/L	0
8/15/01 12:50	610	NH3+NH4-N TOTAL MG/L	0
7/17/01 10:30	610	NH3+NH4-N TOTAL MG/L	0
6/25/01 8:30	610	NH3+NH4-N TOTAL MG/L	0
5/17/01 9:00	610	NH3+NH4-N TOTAL MG/L	0
4/10/01 10:15	610	NH3+NH4-N TOTAL MG/L	0.05
3/8/01 10:00	610	NH3+NH4-N TOTAL MG/L	0
2/6/01 11:00	610	NH3+NH4-N TOTAL MG/L	0
1/17/01 11:30	610	NH3+NH4-N TOTAL MG/L	0
12/27/00 13:00	610	NH3+NH4-N TOTAL MG/L	0
11/29/00 10:30	610	NH3+NH4-N TOTAL MG/L	0.05
10/18/00 10:00	610	NH3+NH4-N TOTAL MG/L	0
9/19/00 9:00	610	NH3+NH4-N TOTAL MG/L	0
8/16/00 13:35	610	NH3+NH4-N TOTAL MG/L	0
7/26/00 9:40	610	NH3+NH4-N TOTAL MG/L	0
6/26/00 9:35	610	NH3+NH4-N TOTAL MG/L	0
5/24/00 9:05	610	NH3+NH4-N TOTAL MG/L	0
4/6/00 9:15	610	NH3+NH4-N TOTAL MG/L	0
3/29/00 12:00	610	NH3+NH4-N TOTAL MG/L	0

2/14/00 9:00	610	NH3+NH4-N TOTAL MG/L	0
1/26/00 9:15	610	NH3+NH4-N TOTAL MG/L	0
12/14/99 9:30	610	NH3+NH4-N TOTAL MG/L	0.1
11/16/99 9:10	610	NH3+NH4-N TOTAL MG/L	0
10/13/99 8:31	610	NH3+NH4-N TOTAL MG/L	0
9/21/99 9:25	610	NH3+NH4-N TOTAL MG/L	0
8/17/99 9:25	610	NH3+NH4-N TOTAL MG/L	0
7/26/99 9:30	610	NH3+NH4-N TOTAL MG/L	0
6/22/99 8:40	610	NH3+NH4-N TOTAL MG/L	0.04
5/10/99 8:20	610	NH3+NH4-N TOTAL MG/L	0
4/26/99 8:50	610	NH3+NH4-N TOTAL MG/L	0
3/30/99 9:05	610	NH3+NH4-N TOTAL MG/L	0
2/10/99 8:10	610	NH3+NH4-N TOTAL MG/L	0.05
1/28/99 8:15	610	NH3+NH4-N TOTAL MG/L	0
12/8/98 9:30	610	NH3+NH4-N TOTAL MG/L	0
11/17/98 9:15	610	NH3+NH4-N TOTAL MG/L	0.09
10/20/98 9:30	610	NH3+NH4-N TOTAL MG/L	0
9/1/98 9:35	610	NH3+NH4-N TOTAL MG/L	0
8/12/98 11:00	610	NH3+NH4-N TOTAL MG/L	0
7/28/98 9:30	610	NH3+NH4-N TOTAL MG/L	0
6/4/98 8:10	610	NH3+NH4-N TOTAL MG/L	0
5/11/98 10:00	610	NH3+NH4-N TOTAL MG/L	0
4/15/98 8:50	610	NH3+NH4-N TOTAL MG/L	0
3/19/98 8:15	610	NH3+NH4-N TOTAL MG/L	0
2/12/98 9:00	610	NH3+NH4-N TOTAL MG/L	0.04
1/22/98 8:30	610	NH3+NH4-N TOTAL MG/L	0.08
12/2/97 9:00	610	NH3+NH4-N TOTAL MG/L	0
11/4/97 12:15	610	NH3+NH4-N TOTAL MG/L	0.15
10/20/97 10:10	610	NH3+NH4-N TOTAL MG/L	0
9/25/97 8:45	610	NH3+NH4-N TOTAL MG/L	0
8/25/97 9:20	610	NH3+NH4-N TOTAL MG/L	0
7/9/97 10:10	610	NH3+NH4-N TOTAL MG/L	0
6/11/97 9:00	610	NH3+NH4-N TOTAL MG/L	0
5/28/97 8:25	610	NH3+NH4-N TOTAL MG/L	0
4/16/97 9:55	610	NH3+NH4-N TOTAL MG/L	0.06
3/25/97 8:40	610	NH3+NH4-N TOTAL MG/L	0
2/12/97 9:45	610	NH3+NH4-N TOTAL MG/L	0.2
1/22/97 8:30	610	NH3+NH4-N TOTAL MG/L	0

NITRATE

0.87

6/12/03 9:00	620	NO3-N TOTAL MG/L	1.34
4/10/03 9:30	620	NO3-N TOTAL MG/L	2.11
3/10/03 12:30	620	NO3-N TOTAL MG/L	1.66
2/11/03 8:55	620	NO3-N TOTAL MG/L	1.08
1/22/03 14:15	620	NO3-N TOTAL MG/L	1.37
12/12/02 14:15	620	NO3-N TOTAL MG/L	1.02
11/20/02 12:30	620	NO3-N TOTAL MG/L	1.56
10/31/02 9:20	620	NO3-N TOTAL MG/L	0.56
9/19/02 9:45	620	NO3-N TOTAL MG/L	0.51
8/20/02 9:30	620	NO3-N TOTAL MG/L	0.35
7/30/02 10:50	620	NO3-N TOTAL MG/L	0.47
6/25/02 8:30	620	NO3-N TOTAL MG/L	0.67

5/30/02 9:15	620	NO3-N TOTAL MG/L	0.83
4/30/02 10:30	620	NO3-N TOTAL MG/L	0.96
3/18/02 13:00	620	NO3-N TOTAL MG/L	1.25
2/25/02 14:00	620	NO3-N TOTAL MG/L	0.88
1/23/02 10:05	620	NO3-N TOTAL MG/L	0.47
12/18/01 13:30	620	NO3-N TOTAL MG/L	0.62
11/27/01 12:00	620	NO3-N TOTAL MG/L	0.55
10/25/01 13:50	620	NO3-N TOTAL MG/L	0.67
9/11/01 9:30	620	NO3-N TOTAL MG/L	0.72
8/15/01 12:50	620	NO3-N TOTAL MG/L	1.05
7/17/01 10:30	620	NO3-N TOTAL MG/L	0.85
6/25/01 8:30	620	NO3-N TOTAL MG/L	1.31
5/17/01 9:00	620	NO3-N TOTAL MG/L	1.28
4/10/01 10:15	620	NO3-N TOTAL MG/L	0.98
3/8/01 10:00	620	NO3-N TOTAL MG/L	0.62
2/6/01 11:00	620	NO3-N TOTAL MG/L	1.72
1/17/01 11:30	620	NO3-N TOTAL MG/L	0.69
12/27/00 13:00	620	NO3-N TOTAL MG/L	0.45
11/29/00 10:30	620	NO3-N TOTAL MG/L	0.53
10/18/00 10:00	620	NO3-N TOTAL MG/L	0.59
9/19/00 9:00	620	NO3-N TOTAL MG/L	0.72
8/16/00 13:35	620	NO3-N TOTAL MG/L	0.64
7/26/00 9:40	620	NO3-N TOTAL MG/L	0.81
6/26/00 9:35	620	NO3-N TOTAL MG/L	0.55
5/24/00 9:05	620	NO3-N TOTAL MG/L	1.05
4/6/00 9:15	620	NO3-N TOTAL MG/L	0.93
3/29/00 12:00	620	NO3-N TOTAL MG/L	0.91
2/14/00 9:00	620	NO3-N TOTAL MG/L	0.75
1/26/00 9:15	620	NO3-N TOTAL MG/L	1.88
12/14/99 9:30	620	NO3-N TOTAL MG/L	0.47
11/16/99 9:10	620	NO3-N TOTAL MG/L	0.55
10/13/99 8:31	620	NO3-N TOTAL MG/L	0.55
9/21/99 9:25	620	NO3-N TOTAL MG/L	0.39
8/17/99 9:25	620	NO3-N TOTAL MG/L	0.56
7/26/99 9:30	620	NO3-N TOTAL MG/L	0.72
6/22/99 8:40	620	NO3-N TOTAL MG/L	0.85
5/10/99 8:20	620	NO3-N TOTAL MG/L	0.75
4/26/99 8:50	620	NO3-N TOTAL MG/L	0.96
3/30/99 9:05	620	NO3-N TOTAL MG/L	0.87
2/10/99 8:10	620	NO3-N TOTAL MG/L	0.96
1/28/99 8:15	620	NO3-N TOTAL MG/L	0.87
12/8/98 9:30	620	NO3-N TOTAL MG/L	0.49
11/17/98 9:15	620	NO3-N TOTAL MG/L	0.58
10/20/98 9:30	620	NO3-N TOTAL MG/L	0.76
9/1/98 9:35	620	NO3-N TOTAL MG/L	0.58
8/12/98 11:00	620	NO3-N TOTAL MG/L	0.94
7/28/98 9:30	620	NO3-N TOTAL MG/L	0.74
6/4/98 8:10	620	NO3-N TOTAL MG/L	1.06
5/11/98 10:00	620	NO3-N TOTAL MG/L	1.57
4/15/98 8:50	620	NO3-N TOTAL MG/L	1.22
3/19/98 8:15	620	NO3-N TOTAL MG/L	1.33
2/12/98 9:00	620	NO3-N TOTAL MG/L	1.37

1/22/98 8:30	620	NO3-N TOTAL MG/L	0.76
12/2/97 9:00	620	NO3-N TOTAL MG/L	0.64
11/4/97 12:15	620	NO3-N TOTAL MG/L	0.34
10/20/97 10:10	620	NO3-N TOTAL MG/L	0.47
9/25/97 8:45	620	NO3-N TOTAL MG/L	0.48
8/25/97 9:20	620	NO3-N TOTAL MG/L	0.2
7/9/97 10:10	620	NO3-N TOTAL MG/L	0.88
6/11/97 9:00	620	NO3-N TOTAL MG/L	0.82
5/28/97 8:25	620	NO3-N TOTAL MG/L	0.61
4/16/97 9:55	620	NO3-N TOTAL MG/L	1.18
3/25/97 8:40	620	NO3-N TOTAL MG/L	1.17
2/12/97 9:45	620	NO3-N TOTAL MG/L	1.16
1/22/97 8:30	620	NO3-N TOTAL MG/L	0.95

CHLORIDE 7.56

6/25/01 8:30	940	CHLORIDE TOTAL MG/L	9.9
5/17/01 9:00	940	CHLORIDE TOTAL MG/L	11.7
4/10/01 10:15	940	CHLORIDE TOTAL MG/L	10.2
3/8/01 10:00	940	CHLORIDE TOTAL MG/L	10
2/6/01 11:00	940	CHLORIDE TOTAL MG/L	15.4
1/17/01 11:30	940	CHLORIDE TOTAL MG/L	9.2
12/27/00 13:00	940	CHLORIDE TOTAL MG/L	8.2
11/29/00 10:30	940	CHLORIDE TOTAL MG/L	8
10/18/00 10:00	940	CHLORIDE TOTAL MG/L	8.6
9/19/00 9:00	940	CHLORIDE TOTAL MG/L	9.1
8/16/00 13:35	940	CHLORIDE TOTAL MG/L	8.1
7/26/00 9:40	940	CHLORIDE TOTAL MG/L	6.4
6/26/00 9:35	940	CHLORIDE TOTAL MG/L	6.6
5/24/00 9:05	940	CHLORIDE TOTAL MG/L	8.8
4/6/00 9:15	940	CHLORIDE TOTAL MG/L	9.1
3/29/00 12:00	940	CHLORIDE TOTAL MG/L	9.2
2/14/00 9:00	940	CHLORIDE TOTAL MG/L	8.1
1/26/00 9:15	940	CHLORIDE TOTAL MG/L	7.5
12/14/99 9:30	940	CHLORIDE TOTAL MG/L	0
11/16/99 9:10	940	CHLORIDE TOTAL MG/L	6.3
10/13/99 8:31	940	CHLORIDE TOTAL MG/L	7.3
9/21/99 9:25	940	CHLORIDE TOTAL MG/L	7
8/17/99 9:25	940	CHLORIDE TOTAL MG/L	8.2
7/26/99 9:30	940	CHLORIDE TOTAL MG/L	7.6
6/22/99 8:40	940	CHLORIDE TOTAL MG/L	8.1
5/10/99 8:20	940	CHLORIDE TOTAL MG/L	8.4
4/26/99 8:50	940	CHLORIDE TOTAL MG/L	9.7
3/30/99 9:05	940	CHLORIDE TOTAL MG/L	8.2
2/10/99 8:10	940	CHLORIDE TOTAL MG/L	8.4
1/28/99 8:15	940	CHLORIDE TOTAL MG/L	6.5
12/8/98 9:30	940	CHLORIDE TOTAL MG/L	5.1
11/17/98 9:15	940	CHLORIDE TOTAL MG/L	5.4
10/20/98 9:30	940	CHLORIDE TOTAL MG/L	8.2
9/1/98 9:35	940	CHLORIDE TOTAL MG/L	5.2
8/12/98 11:00	940	CHLORIDE TOTAL MG/L	7.1
7/28/98 9:30	940	CHLORIDE TOTAL MG/L	5.4
6/4/98 8:10	940	CHLORIDE TOTAL MG/L	6.1

5/11/98 10:00	940	CHLORIDE TOTAL MG/L	10.3
4/15/98 8:50	940	CHLORIDE TOTAL MG/L	7
3/19/98 8:15	940	CHLORIDE TOTAL MG/L	8
2/12/98 9:00	940	CHLORIDE TOTAL MG/L	10.8
1/22/98 8:30	940	CHLORIDE TOTAL MG/L	7.6
12/2/97 9:00	940	CHLORIDE TOTAL MG/L	6.4
11/4/97 12:15	940	CHLORIDE TOTAL MG/L	5.1
10/20/97 10:10	940	CHLORIDE TOTAL MG/L	5.5
9/25/97 8:45	940	CHLORIDE TOTAL MG/L	5.2
8/25/97 9:20	940	CHLORIDE TOTAL MG/L	6
7/9/97 10:10	940	CHLORIDE TOTAL MG/L	5
6/11/97 9:00	940	CHLORIDE TOTAL MG/L	7.8
5/28/97 8:25	940	CHLORIDE TOTAL MG/L	4.2
4/16/97 9:55	940	CHLORIDE TOTAL MG/L	6.8
3/25/97 8:40	940	CHLORIDE TOTAL MG/L	6.7
2/12/97 9:45	940	CHLORIDE TOTAL MG/L	8.1
1/22/97 8:30	940	CHLORIDE TOTAL MG/L	5.7

SULFATE **7.71**

6/25/01 8:30	945	SULFATE SO4-TOT MG/L	9.4
5/17/01 9:00	945	SULFATE SO4-TOT MG/L	10
4/10/01 10:15	945	SULFATE SO4-TOT MG/L	8.9
3/8/01 10:00	945	SULFATE SO4-TOT MG/L	8.6
2/6/01 11:00	945	SULFATE SO4-TOT MG/L	12.2
1/17/01 11:30	945	SULFATE SO4-TOT MG/L	9.3
12/27/00 13:00	945	SULFATE SO4-TOT MG/L	10.1
11/29/00 10:30	945	SULFATE SO4-TOT MG/L	8.4
10/18/00 10:00	945	SULFATE SO4-TOT MG/L	8.7
9/19/00 9:00	945	SULFATE SO4-TOT MG/L	9.3
8/16/00 13:35	945	SULFATE SO4-TOT MG/L	7.9
7/26/00 9:40	945	SULFATE SO4-TOT MG/L	5.7
6/26/00 9:35	945	SULFATE SO4-TOT MG/L	8.1
5/24/00 9:05	945	SULFATE SO4-TOT MG/L	8.7
4/6/00 9:15	945	SULFATE SO4-TOT MG/L	7.7
3/29/00 12:00	945	SULFATE SO4-TOT MG/L	7.6
2/14/00 9:00	945	SULFATE SO4-TOT MG/L	8.3
1/26/00 9:15	945	SULFATE SO4-TOT MG/L	7.5
12/14/99 9:30	945	SULFATE SO4-TOT MG/L	5.2
11/16/99 9:10	945	SULFATE SO4-TOT MG/L	7.9
10/13/99 8:31	945	SULFATE SO4-TOT MG/L	7.2
9/21/99 9:25	945	SULFATE SO4-TOT MG/L	7.5
8/17/99 9:25	945	SULFATE SO4-TOT MG/L	7.2
7/26/99 9:30	945	SULFATE SO4-TOT MG/L	7.5
6/22/99 8:40	945	SULFATE SO4-TOT MG/L	7.8
5/10/99 8:20	945	SULFATE SO4-TOT MG/L	7.5
4/26/99 8:50	945	SULFATE SO4-TOT MG/L	8
3/30/99 9:05	945	SULFATE SO4-TOT MG/L	6.5
2/10/99 8:10	945	SULFATE SO4-TOT MG/L	7.4
1/28/99 8:15	945	SULFATE SO4-TOT MG/L	5.8
12/8/98 9:30	945	SULFATE SO4-TOT MG/L	6.8
11/17/98 9:15	945	SULFATE SO4-TOT MG/L	6.9
10/20/98 9:30	945	SULFATE SO4-TOT MG/L	7.5

9/1/98 9:35	945	SULFATE SO4-TOT MG/L	6.6
8/12/98 11:00	945	SULFATE SO4-TOT MG/L	7.5
7/28/98 9:30	945	SULFATE SO4-TOT MG/L	6.1
6/4/98 8:10	945	SULFATE SO4-TOT MG/L	7.1
5/11/98 10:00	945	SULFATE SO4-TOT MG/L	9
4/15/98 8:50	945	SULFATE SO4-TOT MG/L	6.7
3/19/98 8:15	945	SULFATE SO4-TOT MG/L	8.3
2/12/98 9:00	945	SULFATE SO4-TOT MG/L	7.9
1/22/98 8:30	945	SULFATE SO4-TOT MG/L	8
12/2/97 9:00	945	SULFATE SO4-TOT MG/L	8.2
11/4/97 12:15	945	SULFATE SO4-TOT MG/L	7
10/20/97 10:10	945	SULFATE SO4-TOT MG/L	6.8
9/25/97 8:45	945	SULFATE SO4-TOT MG/L	6.9
8/25/97 9:20	945	SULFATE SO4-TOT MG/L	8.3
7/9/97 10:10	945	SULFATE SO4-TOT MG/L	6.3
6/11/97 9:00	945	SULFATE SO4-TOT MG/L	8.6
5/28/97 8:25	945	SULFATE SO4-TOT MG/L	5.8
4/16/97 9:55	945	SULFATE SO4-TOT MG/L	6.8
3/25/97 8:40	945	SULFATE SO4-TOT MG/L	7.3
2/12/97 9:45	945	SULFATE SO4-TOT MG/L	7.4
1/22/97 8:30	945	SULFATE SO4-TOT MG/L	6.6
		ANTIMONY (DISSOLVED)	0
6/26/01 15:00	1095	ANTIMONY SB, DISS UG/L	0
11/20/97 10:05	1095	ANTIMONY SB, DISS UG/L	0
		ARSENIC (DISSOLVED)	0.35
6/26/01 15:00	1000	ARSENIC AS, DISS UG/L	0.44
11/20/97 10:05	1000	ARSENIC AS, DISS UG/L	0.25
		BERYLIUM (DISSOLVED)	0
6/26/01 15:00	1010	BERYLIUM BE, DISS UG/L	0
		CADMIUM (DISSOLVED)	0
6/26/01 15:00	1025	CADMIUM CD, DISS UG/L	0
11/20/97 10:05	1025	CADMIUM CD, DISS UG/L	0
		CHROMIUM (DISSOLVED)	0.18
6/26/01 15:00	1030	CHROMIUM CR, DISS UG/L	0.18
11/20/97 10:05	1030	CHROMIUM CR, DISS UG/L	0.18
		COPPER (DISSOLVED)	0.65
6/26/01 15:00	1040	COPPER CU, DISS UG/L	0.67
11/20/97 10:05	1040	COPPER CU, DISS UG/L	0.62
		IRON (DISSOLVED)	0
6/26/01 15:00	1046	IRON FE, DISS UG/L	0
11/20/97 10:05	1046	IRON FE, DISS UG/L	0
		LEAD (DISSOLVED)	0
6/26/01 15:00	1049	LEAD PB, DISS UG/L	0
11/20/97 10:05	1049	LEAD PB, DISS UG/L	0

		MANGANESE (DISSOLVED)	14.32
6/26/01 15:00	1056	MANGNESE MN,DISS UG/L	13.23
11/20/97 10:05	1056	MANGNESE MN,DISS UG/L	15.4
		MERCURY (DISSOLVED)	0
11/20/97 10:05	71890	MERCURY HG,DISS UG/L	0
		NICKEL (DISSOLVED)	0.39
6/26/01 15:00	1065	NICKEL NI,DISS UG/L	0.55
11/20/97 10:05	1065	NICKEL NI,DISS UG/L	0.22
		SELENIUM (DISSOLVED)	0
6/26/01 15:00	1145	SELENIUM SE,DISS UG/L	0
11/20/97 10:05	1145	SELENIUM SE,DISS UG/L	0
		SILVER (DISSOLVED)	0
6/26/01 15:00	1075	SILVER AG,DISS UG/L	0
11/20/97 10:05	1075	SILVER AG,DISS UG/L	0
		THALLIUM (DISSOLVED)	0
6/26/01 15:00	1057	THALLIUM TL,DISS UG/L	0
11/20/97 10:05	1057	THALLIUM TL,DISS UG/L	0
		ZINC (DISSOLVED)	3.68
6/26/01 15:00	1090	ZINC ZN,DISS UG/L	5.93
11/20/97 10:05	1090	ZINC ZN,DISS UG/L	1.42

APPENDIX C

EFFLUENT INFORMATION

Application Monitoring Data Summaries (Outfalls 001-008, 013-015)

DMR Data Summaries

temperature (Outfalls 001-008, 013, 014)

pH (Outfalls 013, 014)

oil & grease (Outfall 014)

Statistics for WQC/WLA spreadsheets (from DMRs and application)

Outfalls 001-004

Outfalls 005-008

Outfall 013

Outfall 014

Clayton Hydroelectric Plant	max daily value	units	# analyses	intake	# analyses
Outfall 001 - Form 2C monitoring					
Part A					
BOD	<5	mg/L	1	<5	1
COD	<10	mg/L	1	<10	1
TOC	3.5	mg/L	1	2.8	1
TSS	<1	mg/L	1	1	1
ammonia	0.3	mg/L	1	<0.2	1
flow	0.407	MGD	4		
winter temperature [avg]	16.1	°C	5	18.2	4
summer temperature [avg]	17.1	°C	3		
pH	7.0 & 7.6	SU	4		
Part B					
chlorine (TRC)	0.4	mg/L	4	0.29	4
fecal coliform	206	MPN	1	79	1
oil & grease	<5.0	mg/L	1	<5.0	1
Part C					
cadmium	<0.5	ug/L	1	<0.5	1
copper	10	ug/L	1	21	1

Clayton Hydroelectric Plant	max daily value	units	# analyses	intake	# analyses
Outfall 002 - Form 2C monitoring					
Part A					
BOD	<5	mg/L	1	<5	1
COD	<10	mg/L	1	<10	1
TOC	3.5	mg/L	1	2.8	1
TSS	<1	mg/L	1	1	1
ammonia	0.3	mg/L	1	<0.2	1
flow	0.404	MGD	4		
winter temperature [avg]	16.1	°C	4	18.2	4
summer temperature [avg]	16.5	°C	4		
pH	7.0 & 7.6	SU	4		
Part B					
chlorine (TRC)	0.4	mg/L	4	0.29	4
fecal coliform	206	MPN	1	79	1
oil & grease	<5.0	mg/L	1	<5.0	1
Part C					
cadmium	<0.5	ug/L	1	<0.5	1
copper	10	ug/L	1	21	1

Clayton Hydroelectric Plant	max. daily value	units	# analyses	intake	# analyses
Outfall 003 - Form 2C monitoring					
Part A					
BOD	<5	mg/L	1	<5	1
COD	<10	mg/L	1	<10	1
TOC	3.5	mg/L	1	2.8	1
TSS	<1	mg/L	1	1	1
ammonia	0.3	mg/L	1	<0.2	1
flow	0.39	MGD	8		
winter temperature [avg]	16.1	°C	4	18.2	4
summer temperature [avg]	17.3	°C	4		
pH	7.0 & 7.6	SU	4		
Part B					
chlorine (TRC)	0.4	mg/L	4	0.29	4
fecal coliform	206	MPN	1	79	1
oil & grease	<5.0	mg/L	1	<5.0	1
Part C					
cadmium	<0.5	ug/L	1	<0.5	1
copper	10	ug/L	1	21	1

Clayton Hydroelectric Plant	max daily value	units	# analyses	intake	# analyses
Outfall 004 - Form 2C monitoring					
Part A					
BOD	<5	mg/L	1	<5	1
COD	<10	mg/L	1	<10	1
TOC	3.5	mg/L	1	2.8	1
TSS	<1	mg/L	1	1	1
ammonia	0.3	mg/L	1	<0.2	1
flow	0.426	MGD	4		
winter temperature [avg]	16.1	°C	4	18.2	4
summer temperature [avg]	23.0	°C	4		
pH	7.0 & 7.6	SU	4		
Part B					
chlorine (TRC)	0.4	mg/L	4	0.29	4
fecal coliform	206	MPN	1	79	1
oil & grease	<5.0	mg/L	1	<5.0	1
Part C					
cadmium	<0.5	ug/L	1	<0.5	1
copper	10	ug/L	1	21	1

Clayton Hydroelectric Plant	max daily value	units	# analyses	intake	# analyses
Outfall 005 - Form 2C monitoring					
Part A					
BOD	<5	mg/L	1	<5	1
COD	79	mg/L	1	<10	1
TOC	1.7	mg/L	1	2.8	1
TSS	3	mg/L	1	1	1
ammonia	0.3	mg/L	1	<0.2	1
flow	0.345	MGD	4		
winter temperature [avg]	15.9	°C	5	18.2	4
summer temperature [avg]	17.3	°C	3		
pH	7.2 & 7.4	SU	4		
Part B					
chlorine (TRC)	0.32	mg/L	4	0.29	4
fecal coliform	205	MPN	1	79	1
oil & grease	<5.0	mg/L	1	<5.0	1
Part C					
cadmium	<0.5	ug/L	1	<0.5	1
copper	11	ug/L	1	21	1

Clayton Hydroelectric Plant	max daily value	units	# analyses	intake	# analyses
Outfall 006 - Form 2C monitoring					
Part A					
BOD	<5	mg/L	1	<5	1
COD	79	mg/L	1	<10	1
TOC	1.7	mg/L	1	2.8	1
TSS	3	mg/L	1	1	1
ammonia	0.3	mg/L	1	<0.2	1
flow	0.331	MGD	4		
winter temperature [avg]	15.9	°C	4	18.2	4
summer temperature [avg]	15.7	°C	4		
pH	7.2 & 7.4	SU	4		
Part B					
chlorine (TRC)	0.32	mg/L	4	0.29	4
fecal coliform	205	MPN	1	79	1
oil & grease	<5.0	mg/L	1	<5.0	1
Part C					
cadmium	<0.5	ug/L	1	<0.5	1
copper	11	ug/L	1	21	1

Clayton Hydroelectric Plant	max daily value	units	# analyses	intake	# analyses
Outfall 007 - Form 2C monitoring					
Part A					
BOD	<5	mg/L	1	<5	1
COD	79	mg/L	1	<10	1
TOC	1.7	mg/L	1	2.8	1
TSS	3	mg/L	1	1	1
ammonia	0.3	mg/L	1	<0.2	1
flow	0.331	MGD	8		
winter temperature [avg]	15.9	°C	4	18.2	4
summer temperature [avg]	17.0	°C	4		
pH	7.2 & 7.4	SU	4		
Part B					
chlorine (TRC)	0.32	mg/L	4	0.29	4
fecal coliform	205	MPN	1	79	1
oil & grease	<5.0	mg/L	1	<5.0	1
Part C					
cadmium	<0.5	ug/L	1	<0.5	1
copper	11	ug/L	1	21	1

Claytor Hydroelectric Plant	max daily value	units	# analyses	intake	# analyses
Outfall 008 - Form 2C monitoring					
Part A					
BOD	<5	mg/L	1	<5	1
COD	79	mg/L	1	<10	1
TOC	1.7	mg/L	1	2.8	1
TSS	3	mg/L	1	1	1
ammonia	0.3	mg/L	1	<0.2	1
flow	0.325	MGD	4		
winter temperature [avg]	15.9	°C	4	18.2	4
summer temperature [avg]	23.0	°C	4		
pH	7.2 & 7.4	SU	4		
Part B					
chlorine (TRC)	0.32	mg/L	4	0.29	4
fecal coliform	205	MPN	1	79	1
oil & grease	<5.0	mg/L	1	<5.0	1
Part C					
cadmium	<0.5	ug/L	1	<0.5	1
copper	11	ug/L	1	21	1

Clayton Hydroelectric Plant	max daily value	units	# analyses	intake	# analyses
Outfall 013 - Form 2C monitoring					
Part A					
BOD	<5	mg/L	1	<5	1
COD	34	mg/L	1	<10	1
TOC	2.5	mg/L	1	2.8	1
TSS	7	mg/L	1	1	1
ammonia	<0.2	mg/L	1	<0.2	1
flow	0.007	MGD	8		
winter temperature [avg]	16.8	°C	4	18.2	4
summer temperature [avg]	19.8	°C	4		
pH	7.71 & 8.20	SU	8		
Part B					
chlorine (TRC)	2.2	mg/L	4	0.29	4
fecal coliform	613	MPN	1	79	1
oil & grease	25.4	mg/L	1	<5.0	1
Part C					
cadmium	<0.5	ug/L	1	<0.5	1
copper	<0.5	ug/L	1	21	1

Claytor Hydroelectric Plant	max daily value	units	# analyses	intake	# analyses
Outfall 014 - Form 2C monitoring					
Part A					
BOD	<5	mg/L	1	<5	1
COD	36	mg/L	1	<10	1
TOC	4.3	mg/L	1	2.8	1
TSS	11	mg/L	1	1	1
ammonia	<0.2	mg/L	1	<0.2	1
flow	0.008	MGD	8		
winter temperature [avg]	16.9	°C	4	18.2	4
summer temperature [avg]	24.4	°C	4		
pH	7.79 & 8.00	SU	8		
Part B					
chlorine (TRC)	1.72	mg/L	4	0.29	4
fecal coliform	687	MPN	1	79	1
oil & grease	20.3	mg/L	1	<5.0	1
Part C					
cadmium	<0.5	ug/L	1	<0.5	1
copper	10	ug/L	1	21	1

Claytor Hydroelectric Plant	grab during first 20 min	units	flow-weighted composite	units	# storm events sampled
Outfall 015 - Form 2F monitoring	maximum values		maximum values		
Part A					
oil & grease	<5	mg/L			2
BOD	<5	mg/L	<5	mg/L	1
COD	12	mg/L	13	mg/L	1
TSS	<1	mg/L	<1	mg/L	1
TKN	0.2	mg/L	0.3	mg/L	1
nitrate/nitrite	2.4	mg/L	2.3	mg/L	1
total phosphorus	0.10	mg/L	0.11	mg/L	1
pH	minimum - 6.51	SU	maximum - 7.64	SU	4

Facility Name:Claytor Hydroelectric Plant			Permit No:VA0087084	
Outfall No	Parameter Code	Parameter Description	Due Date	Concentration Maximum
001	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2008	17
001	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2007	17.1
001	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2007	8.8
001	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2006	8.8
001	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2006	14.3
001	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2004	17.1
001	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2004	16.8
001	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2004	14.1
001	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2004	12.6
001	080	TEMPERATURE, WATER (DEG. C)	10-May-2004	11.1
001	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2004	8.9
001	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2004	5.3
001	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2004	NULL
001	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2004	NULL
001	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2003	NULL
001	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2003	14.8
001	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2003	22.6
001	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2003	21.4
001	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2003	20.6
001	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2003	15.0
001	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2003	12.3
001	080	TEMPERATURE, WATER (DEG. C)	10-May-2003	9.5
001	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2003	8.7
001	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2003	2.6
001	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2003	8.4
001	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2003	9.0
001	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2002	13.1
001	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2002	19.0
001	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2002	15.6
001	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2002	18
001	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2002	13.5
001	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2002	13.3
001	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2002	11.2
001	080	TEMPERATURE, WATER (DEG. C)	10-May-2002	9.4
001	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2002	7.7
001	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2002	7.2
001	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2002	6.5
001	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2002	12.3
001	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2001	17.6
001	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2001	17.6
001	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2001	19.7
001	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2001	16.6
001	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2001	X
001	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2001	16.6
001	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2001	10.5
001	080	TEMPERATURE, WATER (DEG. C)	10-May-2001	10.7
001	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2001	8.8
001	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2001	5.6
001	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2001	7.6
			max temp	22.6
			min temp	2.6

Outfall No	Parameter Code	Parameter Description	Due Date	Concentration Maximum
002	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2008	15
002	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2008	15
002	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2007	15
002	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2006	16
002	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2006	16.0
002	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2004	16.5
002	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2004	17.1
002	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2004	14.6
002	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2004	13.2
002	080	TEMPERATURE, WATER (DEG. C)	10-May-2004	10.1
002	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2004	6.9
002	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2004	8.8
002	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2004	NULL
002	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2004	NULL
002	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2003	NULL
002	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2003	NULL
002	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2003	23.1
002	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2003	21.5
002	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2003	19.8
002	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2003	16.6
002	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2003	14.0
002	080	TEMPERATURE, WATER (DEG. C)	10-May-2003	10.2
002	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2003	8.7
002	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2003	3.0
002	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2003	9.9
002	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2003	10.2
002	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2002	13.3
002	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2002	17.2
002	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2002	17.6
002	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2002	18.6
002	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2002	15.7
002	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2002	16
002	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2002	12.9
002	080	TEMPERATURE, WATER (DEG. C)	10-May-2002	10.1
002	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2002	8
002	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2002	10.6
002	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2002	7
002	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2002	14.5
002	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2001	16.6
002	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2001	17
002	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2001	19.4
002	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2001	18.3
002	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2001	X
002	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2001	18.9
002	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2001	10.1
002	080	TEMPERATURE, WATER (DEG. C)	10-May-2001	10.5
002	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2001	8.2
002	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2001	6.6
002	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2001	6.4

max temp 23.1
min temp 3.0

Outfall No	Parameter Code	Parameter Description	Due Date	Concentration Maximum
003	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2008	14
003	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2008	14
003	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2007	14.4
003	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2006	16
003	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2006	17.3
003	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2004	17.1
003	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2004	17.1
003	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2004	14.6
003	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2004	12.7
003	080	TEMPERATURE, WATER (DEG. C)	10-May-2004	10.1
003	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2004	7.2
003	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2004	4.5
003	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2004	7.2
003	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2004	14.0
003	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2003	15.1
003	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2003	13.8
003	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2003	21.5
003	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2003	20.8
003	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2003	21.0
003	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2003	16.4
003	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2003	14.4
003	080	TEMPERATURE, WATER (DEG. C)	10-May-2003	9.9
003	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2003	6.7
003	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2003	3.8
003	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2003	7.2
003	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2003	9.9
003	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2002	13.8
003	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2002	17.1
003	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2002	17.0
003	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2002	17.4
003	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2002	15.5
003	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2002	14
003	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2002	11.7
003	080	TEMPERATURE, WATER (DEG. C)	10-May-2002	10.0
003	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2002	7.8
003	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2002	8.2
003	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2002	3.3
003	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2002	13.4
003	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2001	16.4
003	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2001	17.6
003	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2001	19.9
003	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2001	16.2
003	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2001	X
003	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2001	18.2
003	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2001	11
003	080	TEMPERATURE, WATER (DEG. C)	10-May-2001	10.4
003	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2001	8.8
003	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2001	6.3
003	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2001	7.7

max temp 21.5

min temp 3.3

Facility Name:Claytor Hydroelectric Plant			Permit No:VA0087084	
Outfall No	Parameter Code	Parameter Description	Due Date	Concentration Maximum
004	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2008	18
004	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2007	17.7
004	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2006	23
004	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2006	22.9
004	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2004	21.0
004	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2004	21.8
004	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2004	15.4
004	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2004	13.4
004	080	TEMPERATURE, WATER (DEG. C)	10-May-2004	8.0
004	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2004	6.3
004	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2004	5.6
004	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2004	8.0
004	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2004	13.5
004	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2003	14.8
004	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2003	13.9
004	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2003	21.8
004	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2003	NULL
004	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2003	21.8
004	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2003	18.7
004	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2003	14.5
004	080	TEMPERATURE, WATER (DEG. C)	10-May-2003	10.1
004	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2003	9.0
004	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2003	2.6
004	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2003	8.5
004	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2003	8.8
004	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2002	15.0
004	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2002	15.4
004	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2002	20.1
004	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2002	19.9
004	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2002	19.3
004	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2002	18.7
004	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2002	13.7
004	080	TEMPERATURE, WATER (DEG. C)	10-May-2002	9.9
004	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2002	7.7
004	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2002	7.7
004	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2002	3
004	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2002	12.9
004	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2001	15.7
004	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2001	22
004	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2001	23.7
004	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2001	20.2
004	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2001	X
004	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2001	18.8
004	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2001	11.6
004	080	TEMPERATURE, WATER (DEG. C)	10-May-2001	10.2
004	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2001	7.8
004	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2001	5.7
004	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2001	7.7

max temp 23.7
min temp 2.6

Facility Name: Claytor Hydroelectric Plant			Permit No: VA0087084	
Outfall No	Parameter Code	Parameter Description	Due Date	Concentration Maximum
005	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2008	17
005	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2008	17
005	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2007	16.8
005	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2007	8.7
005	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2006	8.7
005	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2006	14.4
005	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2004	17.3
005	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2004	17.9
005	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2004	14.0
005	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2004	12.3
005	080	TEMPERATURE, WATER (DEG. C)	10-May-2004	16.4
005	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2004	7.5
005	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2004	6.8
005	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2004	NULL
005	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2004	NULL
005	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2003	NULL
005	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2003	13.9
005	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2003	22.5
005	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2003	21.7
005	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2003	21.5
005	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2003	15.3
005	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2003	12.3
005	080	TEMPERATURE, WATER (DEG. C)	10-May-2003	10.8
005	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2003	11.8
005	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2003	2.8
005	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2003	9.5
005	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2003	8.9
005	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2002	13.6
005	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2002	17.5
005	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2002	15.5
005	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2002	16.2
005	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2002	16.1
005	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2002	12.7
005	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2002	11.4
005	080	TEMPERATURE, WATER (DEG. C)	10-May-2002	8.5
005	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2002	7.4
005	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2002	7.4
005	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2002	6.2
005	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2002	12.6
005	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2001	18.5
005	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2001	17.7
005	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2001	19.2
005	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2001	15.5
005	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2001	X
005	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2001	16.9
005	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2001	13.2
005	080	TEMPERATURE, WATER (DEG. C)	10-May-2001	13
005	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2001	8.8
005	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2001	6.2
005	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2001	10.6

max temp 22.5
min temp 2.8

Facility Name:Claytor Hydroelectric Plant			Permit No:VA0087084	
Outfall No	Parameter Code	Parameter Description	Due Date	Concentration Maximum
006	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2008	17
006	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2008	17
006	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2007	16.5
006	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2006	16
006	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2006	14.1
006	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2004	16.3
006	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2004	16.3
006	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2004	14.4
006	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2004	12.7
006	080	TEMPERATURE, WATER (DEG. C)	10-May-2004	9.3
006	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2004	6.0
006	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2004	5.0
006	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2004	NULL
006	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2004	NULL
006	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2003	NULL
006	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2003	NULL
006	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2003	24
006	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2003	22.1
006	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2003	21.7
006	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2003	15.1
006	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2003	14.4
006	080	TEMPERATURE, WATER (DEG. C)	10-May-2003	11.0
006	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2003	10.1
006	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2003	4.2
006	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2003	8.6
006	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2003	11.1
006	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2002	13.6
006	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2002	18.1
006	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2002	16.4
006	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2002	16
006	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2002	15.5
006	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2002	13.1
006	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2002	11.7
006	080	TEMPERATURE, WATER (DEG. C)	10-May-2002	9.6
006	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2002	8.2
006	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2002	8.3
006	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2002	9.4
006	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2002	15.9
006	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2001	17.1
006	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2001	17.7
006	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2001	19.9
006	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2001	18.6
006	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2001	X
006	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2001	18.3
006	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2001	15.6
006	080	TEMPERATURE, WATER (DEG. C)	10-May-2001	11.7
006	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2001	10.3
006	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2001	9.6
006	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2001	7.1

max temp 24.0
min temp 4.2

Facility Name:Claytor Hydroelectric Plant			Permit No:VA0087084	
Outfall No	Parameter Code	Parameter Description	Due Date	Concentration Maximum
007	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2008	16
007	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2008	16
007	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2007	15.9
007	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2006	17
007	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2006	17.0
007	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2004	16.7
007	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2004	16.9
007	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2004	14.5
007	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2004	12.1
007	080	TEMPERATURE, WATER (DEG. C)	10-May-2004	11.7
007	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2004	7.1
007	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2004	6.2
007	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2004	8.0
007	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2004	13.1
007	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2003	16.5
007	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2003	14.0
007	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2003	22.6
007	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2003	20.7
007	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2003	21.0
007	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2003	15.2
007	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2003	13.6
007	080	TEMPERATURE, WATER (DEG. C)	10-May-2003	10.0
007	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2003	8.4
007	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2003	2.8
007	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2003	6.3
007	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2003	8.9
007	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2002	13.8
007	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2002	22.2
007	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2002	15.9
007	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2002	17
007	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2002	14.6
007	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2002	13.2
007	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2002	14.0
007	080	TEMPERATURE, WATER (DEG. C)	10-May-2002	11.2
007	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2002	7.4
007	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2002	6.5
007	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2002	4.8
007	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2002	14.1
007	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2001	17.3
007	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2001	17.7
007	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2001	20.1
007	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2001	18.7
007	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2001	X
007	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2001	16.8
007	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2001	12
007	080	TEMPERATURE, WATER (DEG. C)	10-May-2001	11.6
007	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2001	8.1
007	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2001	7.6
007	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2001	10.5

max temp 22.6
min temp 2.8

Facility Name:Claytor Hydroelectric Plant			Permit No:VA0087084	
Outfall No	Parameter Code	Parameter Description	Due Date	Concentration Maximum
008	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2008	19
008	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2008	19
008	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2007	18.5
008	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2006	23
008	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2006	22.9
008	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2004	20.1
008	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2004	20.9
008	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2004	15.6
008	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2004	13.1
008	080	TEMPERATURE, WATER (DEG. C)	10-May-2004	18.6
008	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2004	6.3
008	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2004	5.3
008	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2004	9.1
008	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2004	12.9
008	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2003	16.1
008	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2003	13.0
008	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2003	22.0
008	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2003	NULL
008	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2003	22.2
008	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2003	18.0
008	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2003	14.8
008	080	TEMPERATURE, WATER (DEG. C)	10-May-2003	10.5
008	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2003	10.2
008	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2003	4.0
008	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2003	8.5
008	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2003	10.3
008	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2002	15.3
008	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2002	22.4
008	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2002	19.7
008	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2002	19.4
008	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2002	18.3
008	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2002	15.5
008	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2002	14.2
008	080	TEMPERATURE, WATER (DEG. C)	10-May-2002	10.5
008	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2002	7.9
008	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2002	8.4
008	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2002	3.4
008	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2002	13.3
008	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2001	15.5
008	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2001	19.6
008	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2001	21.2
008	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2001	18.2
008	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2001	X
008	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2001	19.2
008	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2001	12
008	080	TEMPERATURE, WATER (DEG. C)	10-May-2001	9.9
008	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2001	8
008	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2001	5.6
008	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2001	8.2

max temp 23.0
min temp 3.4

Facility Name:Clayton Hydroelectric Plant			Permit No:VA0087084	
Outfall No	Parameter Code	Parameter Description	Due Date	Concentration Maximum
013	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2008	16
013	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2008	16
013	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2007	16.3
013	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2006	17
013	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2006	19.8
013	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2004	18.9
013	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2004	18.0
013	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2004	16.0
013	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2004	13.4
013	080	TEMPERATURE, WATER (DEG. C)	10-May-2004	8.9
013	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2004	7.5
013	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2004	1.8
013	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2004	6.5
013	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2004	11.7
013	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2003	13.3
013	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2003	14.0
013	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2003	19.7
013	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2003	19.5
013	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2003	15.7
013	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2003	13.2
013	080	TEMPERATURE, WATER (DEG. C)	10-May-2003	9.7
013	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2003	6.9
013	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2003	3.6
013	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2003	7.8
013	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2003	8.4
013	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2002	13.4
013	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2002	18.3
013	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2002	18.6
013	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2002	19.5
013	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2002	16.3
013	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2002	14.5
013	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2002	12.4
013	080	TEMPERATURE, WATER (DEG. C)	10-May-2002	9.2
013	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2002	6.9
013	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2002	8.4
013	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2002	7.4
013	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2002	13
013	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2001	14.9
013	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2001	19.2
013	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2001	20.2
013	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2001	18.6
013	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2001	14
013	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2001	12.4
013	080	TEMPERATURE, WATER (DEG. C)	10-May-2001	9.5
013	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2001	7.2
013	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2001	6
013	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2001	6.5

max temp 20.2
min temp 1.8

Facility Name:Claytor Hydroelectric Plant			Permit No:VA0087084	
Outfall No	Parameter Code	Parameter Description	Due Date	Concentration Maximum
014	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2008	17
014	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2008	17
014	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2007	16.7
014	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2006	17
014	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2006	19.5
014	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2004	18.0
014	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2004	17.9
014	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2004	15.5
014	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2004	12.4
014	080	TEMPERATURE, WATER (DEG. C)	10-May-2004	8.5
014	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2004	5.0
014	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2004	4.5
014	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2004	7.8
014	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2004	11.5
014	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2003	13.5
014	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2003	14.2
014	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2003	19.5
014	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2003	21.5
014	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2003	19.3
014	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2003	16.0
014	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2003	13.5
014	080	TEMPERATURE, WATER (DEG. C)	10-May-2003	11.4
014	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2003	5.0
014	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2003	3.4
014	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2003	6.3
014	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2003	8.3
014	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2002	13.5
014	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2002	18.4
014	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2002	18.4
014	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2002	17.1
014	080	TEMPERATURE, WATER (DEG. C)	10-Aug-2002	16.8
014	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2002	14
014	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2002	12.6
014	080	TEMPERATURE, WATER (DEG. C)	10-May-2002	9.9
014	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2002	7
014	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2002	7.7
014	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2002	7.4
014	080	TEMPERATURE, WATER (DEG. C)	10-Jan-2002	12.1
014	080	TEMPERATURE, WATER (DEG. C)	10-Dec-2001	14.8
014	080	TEMPERATURE, WATER (DEG. C)	10-Nov-2001	17.5
014	080	TEMPERATURE, WATER (DEG. C)	10-Oct-2001	19.2
014	080	TEMPERATURE, WATER (DEG. C)	10-Sep-2001	20.6
014	080	TEMPERATURE, WATER (DEG. C)	10-Jul-2001	14
014	080	TEMPERATURE, WATER (DEG. C)	10-Jun-2001	11.7
014	080	TEMPERATURE, WATER (DEG. C)	10-May-2001	10
014	080	TEMPERATURE, WATER (DEG. C)	10-Apr-2001	7.4
014	080	TEMPERATURE, WATER (DEG. C)	10-Mar-2001	6.3
014	080	TEMPERATURE, WATER (DEG. C)	10-Feb-2001	6.6

max temp 21.5
min temp 3.4

Facility Name:Claytor Hydroelectric Plant				Permit No:VA0087084	
Outfall No	Parameter Code	Parameter Description	Due Date	Concentration Minimum	Concentration Maximum
013	002	PH	10-Jul-2008	7.94	7.94
013	002	PH	10-Jul-2007	8.2	8.2
013	002	PH	10-Jul-2006	7.96	7.96
013	002	PH	10-Sep-2004	7.71	7.71
013	002	PH	10-Aug-2004	7.88	7.88
013	002	PH	10-Jul-2004	7.20	7.20
013	002	PH	10-Jun-2004	7.80	7.80
013	002	PH	10-May-2004	7.17	7.17
013	002	PH	10-Apr-2004	7.78	7.78
013	002	PH	10-Mar-2004	8.15	8.15
013	002	PH	10-Feb-2004	8.19	8.19
013	002	PH	10-Jan-2004	7.05	7.05
013	002	PH	10-Dec-2003	7.41	7.41
013	002	PH	10-Nov-2003	7.69	7.69
013	002	PH	10-Oct-2003	7.79	7.79
013	002	PH	10-Aug-2003	8.04	8.04
013	002	PH	10-Jul-2003	7.66	7.66
013	002	PH	10-Jun-2003	8.06	8.06
013	002	PH	10-May-2003	7.96	7.96
013	002	PH	10-Apr-2003	8.39	8.39
013	002	PH	10-Mar-2003	8.08	8.08
013	002	PH	10-Feb-2003	8.44	8.44
013	002	PH	10-Jan-2003	8.43	8.43
013	002	PH	10-Dec-2002	7.89	7.89
013	002	PH	10-Nov-2002	8.41	8.41
013	002	PH	10-Oct-2002	8.01	8.01
013	002	PH	10-Sep-2002	7.78	7.78
013	002	PH	10-Aug-2002	7.82	7.82
013	002	PH	10-Jul-2002	8.13	8.13
013	002	PH	10-Jun-2002	7.54	7.54
013	002	PH	10-May-2002	7.45	7.45
013	002	PH	10-Apr-2002	8.28	8.28
013	002	PH	10-Mar-2002	8.51	8.51
013	002	PH	10-Feb-2002	7.38	7.38
013	002	PH	10-Jan-2002	7.36	7.36
013	002	PH	10-Dec-2001	7.44	7.44
013	002	PH	10-Nov-2001	7.87	7.87
013	002	PH	10-Oct-2001	7.82	7.82
013	002	PH	10-Sep-2001	7.97	7.97
013	002	PH	10-Jul-2001	7.9	7.9
013	002	PH	10-Jun-2001	6.98	6.98
013	002	PH	10-May-2001	7.77	7.77
013	002	PH	10-Apr-2001	7.32	7.32
013	002	PH	10-Mar-2001	7.93	7.93
013	002	PH	10-Feb-2001	7.8	7.8

6.98
minimum pH

8.51
maximum pH

Facility Name: Claytor Hydroelectric Plant				Permit No: VA0087084		
Outfall No	Parameter Code	Parameter Description	Due Date	Concentration	Minimum	Concentration Maximum
014	002	PH	10-Jul-2008	7.88		7.88
014	002	PH	10-Jul-2007	8.5		8.5
014	002	PH	10-Jul-2006	7.94		7.94
014	002	PH	10-Sep-2004	7.79		7.79
014	002	PH	10-Aug-2004	8.40		8.40
014	002	PH	10-Jul-2004	7.14		7.14
014	002	PH	10-Jun-2004	7.66		7.66
014	002	PH	10-May-2004	7.29		7.29
014	002	PH	10-Apr-2004	7.87		7.87
014	002	PH	10-Mar-2004	7.0		7.0
014	002	PH	10-Feb-2004	8.04		8.04
014	002	PH	10-Jan-2004	7.29		7.29
014	002	PH	10-Dec-2003	7.60		7.60
014	002	PH	10-Nov-2003	7.70		7.70
014	002	PH	10-Oct-2003	7.81		7.81
014	002	PH	10-Sep-2003	8.07		8.07
014	002	PH	10-Aug-2003	7.88		7.88
014	002	PH	10-Jul-2003	7.39		7.39
014	002	PH	10-Jun-2003	7.97		7.97
014	002	PH	10-May-2003	7.96		7.96
014	002	PH	10-Apr-2003	7.91		7.91
014	002	PH	10-Mar-2003	8.05		8.05
014	002	PH	10-Feb-2003	8.33		8.33
014	002	PH	10-Jan-2003	7.85		7.85
014	002	PH	10-Dec-2002	7.24		7.24
014	002	PH	10-Nov-2002	7.32		7.32
014	002	PH	10-Oct-2002	7.29		7.29
014	002	PH	10-Sep-2002	7.89		7.89
014	002	PH	10-Aug-2002	7.75		7.75
014	002	PH	10-Jul-2002	7.68		7.68
014	002	PH	10-Jun-2002	7.49		7.49
014	002	PH	10-May-2002	8.35		8.35
014	002	PH	10-Apr-2002	8.18		8.18
014	002	PH	10-Mar-2002	8.36		8.36
014	002	PH	10-Feb-2002	7.36		7.36
014	002	PH	10-Jan-2002	7.43		7.43
014	002	PH	10-Dec-2001	7.34		7.34
014	002	PH	10-Nov-2001	7.9		7.9
014	002	PH	10-Oct-2001	7.14		7.14
014	002	PH	10-Sep-2001	8.15		8.15
014	002	PH	10-Aug-2001	X		X
014	002	PH	10-Jul-2001	8.09		8.09
014	002	PH	10-Jun-2001	7.06		7.06
014	002	PH	10-May-2001	7.43		7.43
014	002	PH	10-Apr-2001	6.72		6.72
014	002	PH	10-Mar-2001	7.73		7.73
014	002	PH	10-Feb-2001	7.72		7.72

6.72
minimum pH

8.50
maximum pH

Facility Name: Claytor Hydroelectric Plant			Permit No: VA0087084	
Outfall No	Parameter Code	Parameter Description	Due Date	Concentration Maximum
014	500	OIL & GREASE	10-Jul-2008	<QL
014	500	OIL & GREASE	10-Jul-2007	<QL
014	500	OIL & GREASE	10-Jul-2006	14
014	500	OIL & GREASE	10-Aug-2003	1
014	500	OIL & GREASE	10-Sep-2002	9.6
014	500	OIL & GREASE	10-Sep-2001	0

14

maximum oil & grease

Outfalls 001-004 WQC/WLA Spreadsheet Statistics

001	002	003	004	Temperature (°C)	DMR Due Date	Temperature (°C)
17	15	14	18	16.0	10-Sep-2008	
17.1	15	14		15.4	10-Jul-2008	
8.8	15	14.4	17.7	14.0	10-Sep-2007	
8.8	16	16	23	16.0	10-Sep-2006	
14.3	16	17.3	22.9	17.6	10-Jul-2006	
17.1	16.5	17.1	21	17.9	10-Sep-2004	
16.8	17.1	17.1	21.8	18.2	10-Aug-2004	
14.1	14.6	14.6	15.4	14.7	10-Jul-2004	
12.6	13.2	12.7	13.4	13.0	10-Jun-2004	
11.1	10.1	10.1	8	9.8	10-May-2004	9.8
8.9	6.9	7.2	6.3	7.3	10-Apr-2004	7.3
5.3	8.8	4.5	5.6	6.1	10-Mar-2004	6.1
		7.2	8	7.6	10-Feb-2004	7.6
		14	13.5	13.8	10-Jan-2004	13.8
		15.1	14.8	15.0	10-Dec-2003	
14.8		13.8	13.9	14.2	10-Nov-2003	
22.6	23.1	21.5	21.8	22.3	10-Oct-2003	
21.4	21.5	20.8		21.2	10-Sep-2003	
20.6	19.8	21	21.8	20.8	10-Aug-2003	
15	16.6	16.4	18.7	16.7	10-Jul-2003	
12.3	14	14.4	14.5	13.8	10-Jun-2003	
9.5	10.2	9.9	10.1	9.9	10-May-2003	9.9
8.7	8.7	6.7	9	8.3	10-Apr-2003	8.3
2.6	3	3.8	2.6	3.0	10-Mar-2003	3.0
8.4	9.9	7.2	8.5	8.5	10-Feb-2003	8.5
9	10.2	9.9	8.8	9.5	10-Jan-2003	9.5
13.1	13.3	13.8	15	13.8	10-Dec-2002	
19	17.2	17.1	15.4	17.2	10-Nov-2002	
15.6	17.6	17	20.1	17.6	10-Oct-2002	
18	18.6	17.4	19.9	18.5	10-Sep-2002	
13.5	15.7	15.5	19.3	16.0	10-Aug-2002	
13.3	16	14	18.7	15.5	10-Jul-2002	
11.2	12.9	11.7	13.7	12.4	10-Jun-2002	
9.4	10.1	10	9.9	9.9	10-May-2002	9.9
7.7	8	7.8	7.7	7.8	10-Apr-2002	7.8
7.2	10.6	8.2	7.7	8.4	10-Mar-2002	8.4
6.5	7	3.3	3	5.0	10-Feb-2002	5.0
12.3	14.5	13.4	12.9	13.3	10-Jan-2002	13.3
17.6	16.6	16.4	15.7	16.6	10-Dec-2001	
17.6	17	17.6	22	18.6	10-Nov-2001	
19.7	19.4	19.9	23.7	20.7	10-Oct-2001	
16.6	18.3	16.2	20.2	17.8	10-Sep-2001	
16.6	18.9	18.2	18.8	18.1	10-Jul-2001	
10.5	10.1	11	11.6	10.8	10-Jun-2001	
10.7	10.5	10.4	10.2	10.5	10-May-2001	10.5
8.8	8.2	8.8	7.8	8.4	10-Apr-2001	8.4
5.6	6.6	6.3	5.7	6.1	10-Mar-2001	6.1
7.6	6.4	7.7	7.7	7.4	10-Feb-2001	7.4

18.5

90% annual temp

11.0

90% wet season temp

wet season months: January - May

Outfalls 001-004 WQC/WLA Spreadsheet Statistics

Outfall	max pH*	min pH*	90% max pH	10% max pH
001	7.6	7.0	7.5	7.1
002	7.6	7.0	7.5	7.1
003	7.6	7.0	7.5	7.1
004	7.6	7.0	7.5	7.1

*representative monitoring as shown in application Form 2C

Outfalls 005-008 WQC/WLA Spreadsheet Statistics

005	006	007	008	Temperature (°C)	DMR Due Date	Temperature (°C)
17	17	16	19	17.3	10-Sep-2008	
17	17	16	19	17.3	10-Jul-2008	
16.8	16.5	15.9	18.5	16.9	10-Sep-2007	
8.7				8.7	10-Jul-2007	
8.7	16	17	23	16.2	10-Sep-2006	
14.4		17	22.9	18.1	10-Jul-2006	
17.3	16.3	16.7	20.1	17.6	10-Sep-2004	
17.9	16.3	16.9	20.9	18.0	10-Aug-2004	
14	14.4	14.5	15.6	14.6	10-Jul-2004	
12.3	12.7	12.1	13.1	12.6	10-Jun-2004	
16.4	9.3	11.7	18.6	14.0	10-May-2004	14.0
7.5	6	7.1	6.3	6.7	10-Apr-2004	6.7
6.8	5	6.2	5.3	5.8	10-Mar-2004	5.8
		8	9.1	8.6	10-Feb-2004	8.6
		13.1	12.9	13.0	10-Jan-2004	13.0
		16.5	16.1	16.3	10-Dec-2003	
13.9		14	13	13.6	10-Nov-2003	
22.5	24	22.6	22	22.8	10-Oct-2003	
21.7	22.1	20.7		21.5	10-Sep-2003	
21.5	21.7	21	22.2	21.6	10-Aug-2003	
15.3	15.1	15.2	18	15.9	10-Jul-2003	
12.3	14.4	13.6	14.8	13.8	10-Jun-2003	
10.8	11	10	10.5	10.6	10-May-2003	10.6
11.8	10.1	8.4	10.2	10.1	10-Apr-2003	10.1
2.8	4.2	2.8	4	3.5	10-Mar-2003	3.5
9.5	8.6	6.3	8.5	8.2	10-Feb-2003	8.2
8.9	11.1	8.9	10.3	9.8	10-Jan-2003	9.8
13.6	13.6	13.8	15.3	14.1	10-Dec-2002	
17.5	18.1	22.2	22.4	20.1	10-Nov-2002	
15.5	16.4	15.9	19.7	16.9	10-Oct-2002	
16.2	16	17	19.4	17.2	10-Sep-2002	
16.1	15.5	14.6	18.3	16.1	10-Aug-2002	
12.7	13.1	13.2	15.5	13.6	10-Jul-2002	
11.4	11.7	14	14.2	12.8	10-Jun-2002	
8.5	9.6	11.2	10.5	10.0	10-May-2002	10.0
7.4	8.2	7.4	7.9	7.7	10-Apr-2002	7.7
7.4	8.3	6.5	8.4	7.7	10-Mar-2002	7.7
6.2	9.4	4.8	3.4	6.0	10-Feb-2002	6.0
12.6	15.9	14.1	13.3	14.0	10-Jan-2002	14.0
18.5	17.1	17.3	15.5	17.1	10-Dec-2001	
17.7	17.7	17.7	19.6	18.2	10-Nov-2001	
19.2	19.9	20.1	21.2	20.1	10-Oct-2001	
15.5	18.6	18.7	18.2	17.8	10-Sep-2001	
16.9	18.3	16.8	19.2	17.8	10-Jul-2001	
13.2	15.6	12	12	13.2	10-Jun-2001	
13	11.7	11.6	9.9	11.6	10-May-2001	11.6
8.8	10.3	8.1	8	8.8	10-Apr-2001	8.8
6.2	9.6	7.6	5.6	7.3	10-Mar-2001	7.3
10.6	7.1	10.5	8.2	9.1	10-Feb-2001	9.1

18.7

13.2

90% annual temp

90% wet season temp

wet season months: January - May

Outfalls 005-008 WQC/WLA Spreadsheet Statistics

Outfall	max pH*	min pH*	90% max pH	10% max pH
001	7.4	7.2	7.4	7.2
002	7.4	7.2	7.4	7.2
003	7.4	7.2	7.4	7.2
004	7.4	7.2	7.4	7.2

*representative monitoring as shown in application Form 2C

Outfall 013 WQC/WLA Spreadsheet Statistics		
Temperature (°C)	DMR Due Date	Temperature (°C)
16	10-Sep-2008	
16	10-Jul-2008	
16.3	10-Sep-2007	
17	10-Sep-2006	
19.8	10-Jul-2006	
18.9	10-Sep-2004	
18	10-Aug-2004	
16	10-Jul-2004	
13.4	10-Jun-2004	
8.9	10-May-2004	8.9
7.5	10-Apr-2004	7.5
1.8	10-Mar-2004	1.8
6.5	10-Feb-2004	6.5
11.7	10-Jan-2004	11.7
13.3	10-Dec-2003	
14	10-Nov-2003	
19.7	10-Oct-2003	
19.5	10-Aug-2003	
15.7	10-Jul-2003	
13.2	10-Jun-2003	
9.7	10-May-2003	9.7
6.9	10-Apr-2003	6.9
3.6	10-Mar-2003	3.6
7.8	10-Feb-2003	7.8
8.4	10-Jan-2003	8.4
13.4	10-Dec-2002	
18.3	10-Nov-2002	
18.6	10-Oct-2002	
19.5	10-Sep-2002	
16.3	10-Aug-2002	
14.5	10-Jul-2002	
12.4	10-Jun-2002	
9.2	10-May-2002	9.2
6.9	10-Apr-2002	6.9
8.4	10-Mar-2002	8.4
7.4	10-Feb-2002	7.4
13	10-Jan-2002	13
14.9	10-Dec-2001	
19.2	10-Nov-2001	
20.2	10-Oct-2001	
18.6	10-Sep-2001	
14	10-Jul-2001	
12.4	10-Jun-2001	
9.5	10-May-2001	9.5
7.2	10-Apr-2001	7.2
6	10-Mar-2001	6
6.5	10-Feb-2001	6.5

19.3
90% annual temp

10.1
90% wet season temp

wet season months: Jan-May

Outfall 013 WQC/WLA Spreadsheet Statistics		
pH (SU)	DMR Due Date	pH (SU)
7.94	10-Jul-2008	7.94
8.2	10-Jul-2007	8.2
7.96	10-Jul-2006	7.96
7.71	10-Sep-2004	7.71
7.88	10-Aug-2004	7.88
7.2	10-Jul-2004	7.2
7.8	10-Jun-2004	7.8
7.17	10-May-2004	7.17
7.78	10-Apr-2004	7.78
8.15	10-Mar-2004	8.15
8.19	10-Feb-2004	8.19
7.05	10-Jan-2004	7.05
7.41	10-Dec-2003	7.41
7.69	10-Nov-2003	7.69
7.79	10-Oct-2003	7.79
8.04	10-Aug-2003	8.04
7.66	10-Jul-2003	7.66
8.06	10-Jun-2003	8.06
7.96	10-May-2003	7.96
8.39	10-Apr-2003	8.39
8.08	10-Mar-2003	8.08
8.44	10-Feb-2003	8.44
8.43	10-Jan-2003	8.43
7.89	10-Dec-2002	7.89
8.41	10-Nov-2002	8.41
8.01	10-Oct-2002	8.01
7.78	10-Sep-2002	7.78
7.82	10-Aug-2002	7.82
8.13	10-Jul-2002	8.13
7.54	10-Jun-2002	7.54
7.45	10-May-2002	7.45
8.28	10-Apr-2002	8.28
8.51	10-Mar-2002	8.51
7.38	10-Feb-2002	7.38
7.36	10-Jan-2002	7.36
7.44	10-Dec-2001	7.44
7.87	10-Nov-2001	7.87
7.82	10-Oct-2001	7.82
7.97	10-Sep-2001	7.97
7.9	10-Jul-2001	7.9
6.98	10-Jun-2001	6.98
7.77	10-May-2001	7.77
7.32	10-Apr-2001	7.32
7.93	10-Mar-2001	7.93
7.8	10-Feb-2001	7.8

7.34

10% max pH

8.35

90% max pH

Outfall 014 WQC/WLA Spreadsheet Statistics		
Temperature (°C)	DMR Due Date	Temperature (°C)
17	10-Sep-2008	
17	10-Jul-2008	
16.7	10-Sep-2007	
17	10-Sep-2006	
19.5	10-Jul-2006	
18	10-Sep-2004	
17.9	10-Aug-2004	
15.5	10-Jul-2004	
12.4	10-Jun-2004	
8.5	10-May-2004	8.5
5	10-Apr-2004	5
4.5	10-Mar-2004	4.5
7.8	10-Feb-2004	7.8
11.5	10-Jan-2004	11.5
13.5	10-Dec-2003	
14.2	10-Nov-2003	
19.5	10-Oct-2003	
21.5	10-Sep-2003	
19.3	10-Aug-2003	
16	10-Jul-2003	
13.5	10-Jun-2003	
11.4	10-May-2003	11.4
5	10-Apr-2003	5
3.4	10-Mar-2003	3.4
6.3	10-Feb-2003	6.3
8.3	10-Jan-2003	8.3
13.5	10-Dec-2002	
18.4	10-Nov-2002	
18.4	10-Oct-2002	
17.1	10-Sep-2002	
16.8	10-Aug-2002	
14	10-Jul-2002	
12.6	10-Jun-2002	
9.9	10-May-2002	9.9
7	10-Apr-2002	7
7.7	10-Mar-2002	7.7
7.4	10-Feb-2002	7.4
12.1	10-Jan-2002	12.1
14.8	10-Dec-2001	
17.5	10-Nov-2001	
19.2	10-Oct-2001	
20.6	10-Sep-2001	
14	10-Jul-2001	
11.7	10-Jun-2001	
10	10-May-2001	10
7.4	10-Apr-2001	7.4
6.3	10-Mar-2001	6.3
6.6	10-Feb-2001	6.6

19.2

90% annual temp

11.4

90% wet season temp

wet season months: January - May

Outfall 014 WQC/WLA Spreadsheet Statistics		
pH (SU)	DMR Due Date	pH (SU)
7.88	10-Jul-2008	7.88
8.5	10-Jul-2007	8.5
7.94	10-Jul-2006	7.94
7.79	10-Sep-2004	7.79
8.4	10-Aug-2004	8.4
7.14	10-Jul-2004	7.14
7.66	10-Jun-2004	7.66
7.29	10-May-2004	7.29
7.87	10-Apr-2004	7.87
7	10-Mar-2004	7
8.04	10-Feb-2004	8.04
7.29	10-Jan-2004	7.29
7.6	10-Dec-2003	7.6
7.7	10-Nov-2003	7.7
7.81	10-Oct-2003	7.81
8.07	10-Sep-2003	8.07
7.88	10-Aug-2003	7.88
7.39	10-Jul-2003	7.39
7.97	10-Jun-2003	7.97
7.96	10-May-2003	7.96
7.91	10-Apr-2003	7.91
8.05	10-Mar-2003	8.05
8.33	10-Feb-2003	8.33
7.85	10-Jan-2003	7.85
7.24	10-Dec-2002	7.24
7.32	10-Nov-2002	7.32
7.29	10-Oct-2002	7.29
7.89	10-Sep-2002	7.89
7.75	10-Aug-2002	7.75
7.68	10-Jul-2002	7.68
7.49	10-Jun-2002	7.49
8.35	10-May-2002	8.35
8.18	10-Apr-2002	8.18
8.36	10-Mar-2002	8.36
7.36	10-Feb-2002	7.36
7.43	10-Jan-2002	7.43
7.34	10-Dec-2001	7.34
7.9	10-Nov-2001	7.9
7.14	10-Oct-2001	7.14
8.15	10-Sep-2001	8.15
X	10-Aug-2001	X
8.09	10-Jul-2001	8.09
7.06	10-Jun-2001	7.06
7.43	10-May-2001	7.43
6.72	10-Apr-2001	6.72
7.73	10-Mar-2001	7.73
7.72	10-Feb-2001	7.72

7.19
10% max pH

8.26
90% max pH

APPENDIX D

WATER QUALITY ANALYSES AND ANTIDEGRATION BASELINES/ALLOCATIONS

WQC/WLA spreadsheets

Outfalls 001-004

Outfalls 005-008

Outfall 013

Outfall 014

STATS output

chlorine

copper

FRESHWATER WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Claytor Hydroelectric Plant Outfalls 001-004 Permit No.: VA000087084

Receiving Stream: New River

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) = 76 mg/L
 90% Temperature (Annual) = 23 deg C
 90% Temperature (Wet season) = 13.9 deg C
 90% Maximum pH = 8.2 SU
 10% Maximum pH = 7.3 SU
 Tier Designation (1 or 2) = 2
 Public Water Supply (PWS) Y/N? = Y
 Trout Present Y/N? = N
 Early Life Stages Present Y/N? = Y

Stream Flows

1Q10 (Annual) = 357 MGD
 7Q10 (Annual) = 447 MGD
 30Q10 (Annual) = 506 MGD
 1Q10 (Wet season) = 404 MGD
 30Q10 (Wet season) = 812 MGD
 30Q5 = 563 MGD
 Harmonic Mean = 1144 MGD
 Annual Average = MGD

Mixing Information

Annual - 1Q10 Mix = 100 %
 - 7Q10 Mix = 100 %
 - 30Q10 Mix = 100 %
 Wet Season - 1Q10 Mix = 100 %
 - 30Q10 Mix = 100 %

Effluent Information

Mean Hardness (as CaCO3) = 76 mg/L
 90% Temp (Annual) = 18.5 deg C
 90% Temp (Wet season) = 11 deg C
 90% Maximum pH = 7.5 SU
 10% Maximum pH = 7.1 SU
 Discharge Flow = 0.4 MGD

Parameter (ug/l unless noted)	Background		Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	
Acenaphthene	0	-	-	1.2E+03	2.7E+03	-	-	1.7E+06	3.8E+06	-	-	1.2E+02	2.7E+02	-	-	1.7E+05	3.8E+05	-	-	1.7E+05	3.8E+05	
Acrolein	0	-	-	3.2E+02	7.8E+02	-	-	4.5E+05	1.1E+06	-	-	3.2E+01	7.8E+01	-	-	4.5E+04	1.1E+05	-	-	4.5E+04	1.1E+05	
Acrylonitrile ^c	0	-	-	5.9E-01	6.8E+00	-	-	1.7E+03	1.9E+04	-	-	5.9E-02	6.6E-01	-	-	1.7E+02	1.9E+03	-	-	1.7E+02	1.9E+03	
Aldrin ^c	0	-	-	1.3E-03	1.4E-03	2.7E+03	-	3.7E+00	4.0E+00	7.5E-01	-	1.3E-04	1.4E-04	6.7E+02	-	3.7E-01	4.0E-01	6.7E+02	-	3.7E-01	4.0E-01	
Ammonia-N (mg/l) (Yearly)	0.02	5.75E+00	1.04E+00	-	-	5.1E+03	-	-	-	1.45E+00	2.75E-01	-	-	1.3E+03	3.2E+02	-	-	1.3E+03	3.2E+02	-	-	
Ammonia-N (mg/l) (High Flow)	0.02	5.75E+00	1.80E+00	-	-	5.8E+03	3.6E+03	-	-	1.45E+00	4.64E-01	-	-	1.4E+03	9.0E+02	-	-	1.4E+03	9.0E+02	-	-	
Anthracene	0	-	-	9.6E+03	1.1E+05	-	-	1.4E+07	1.5E+08	-	-	9.6E+02	1.1E+04	-	-	1.4E+06	1.5E+07	-	-	1.4E+06	1.5E+07	
Antimony	0	-	-	1.4E+01	4.3E+03	-	-	2.0E+04	6.1E+06	-	-	1.4E+00	4.3E+02	-	-	2.0E+03	6.1E+05	-	-	2.0E+03	6.1E+05	
Arsenic	0.35	3.4E+02	1.5E+02	1.0E+01	-	3.0E+05	1.7E+05	1.4E+04	-	8.5E+01	3.8E+01	1.3E+00	-	7.6E+04	4.2E+04	1.4E+03	-	7.6E+04	4.2E+04	1.4E+03	-	
Barium	0	-	-	2.0E+03	-	-	-	2.8E+06	-	-	-	2.0E+02	-	-	-	2.8E+05	-	-	-	2.8E+05	-	
Benzene ^c	0	-	-	1.2E+01	7.1E+02	-	-	3.4E+04	2.0E+06	-	-	1.2E+00	7.1E+01	-	-	3.4E+03	2.0E+05	-	-	3.4E+03	2.0E+05	
Benzidine ^c	0	-	-	1.2E-03	5.4E-03	-	-	3.4E+00	1.5E+01	-	-	1.2E-04	5.4E-04	-	-	3.4E-01	1.5E+00	-	-	3.4E-01	1.5E+00	
Benzo (a) anthracene ^c	0	-	-	4.4E-02	4.9E-01	-	-	1.3E+02	1.4E+03	-	-	4.4E-03	4.9E-02	-	-	1.3E+01	1.4E+02	-	-	1.3E+01	1.4E+02	
Benzo (b) fluoranthene ^c	0	-	-	4.4E-02	4.9E-01	-	-	1.3E+02	1.4E+03	-	-	4.4E-03	4.9E-02	-	-	1.3E+01	1.4E+02	-	-	1.3E+01	1.4E+02	
Benzo (k) fluoranthene ^c	0	-	-	4.4E-02	4.9E-01	-	-	1.3E+02	1.4E+03	-	-	4.4E-03	4.9E-02	-	-	1.3E+01	1.4E+02	-	-	1.3E+01	1.4E+02	
Benzo (a) pyrene ^c	0	-	-	3.1E-01	1.4E+01	-	-	4.4E+02	2.0E+04	-	-	3.1E-02	1.4E+00	-	-	4.4E+01	2.0E+03	-	-	4.4E+01	2.0E+03	
Bis(2-Chloroethyl) Ether	0	-	-	1.4E+03	1.7E+05	-	-	2.0E+05	2.4E+08	-	-	1.4E+02	1.7E+04	-	-	2.0E+05	2.4E+07	-	-	2.0E+05	2.4E+07	
Bis(2-Chloroisopropyl) Ether	0	-	-	4.4E+01	3.6E+03	-	-	1.3E+05	1.0E+07	-	-	4.4E+00	3.6E+02	-	-	1.3E+04	1.0E+06	-	-	1.3E+04	1.0E+06	
Bromofom ^c	0	-	-	3.0E+03	5.2E+03	-	-	4.2E+06	7.3E+06	-	-	3.0E+02	5.2E+02	-	-	4.2E+05	7.3E+05	-	-	4.2E+05	7.3E+05	
Butylbenzylphthalate	0	-	-	5.0E+00	-	2.6E+03	1.0E+03	7.0E+03	-	7.2E-01	2.3E-01	5.0E-01	-	6.4E+02	2.6E+02	7.0E+02	-	6.4E+02	2.6E+02	7.0E+02	-	
Cadmium	0	-	-	2.5E+00	4.4E+01	-	-	7.2E+03	1.3E+05	-	-	2.5E-01	4.4E+00	-	-	7.2E+02	1.3E+04	-	-	7.2E+02	1.3E+04	
Carbon Tetrachloride ^c	0	-	-	2.1E-02	2.2E-02	2.1E+03	4.8E+00	6.0E+01	6.3E+01	6.0E-01	1.1E-03	2.1E-03	2.2E-03	5.4E+02	1.2E+00	6.0E+00	6.3E+00	5.4E+02	1.2E+00	6.0E+00	6.3E+00	
Chlordane ^c	0	-	-	2.3E+05	2.5E+05	-	-	7.7E+08	2.6E+08	2.2E+05	5.8E+04	2.5E+04	-	1.9E+08	6.4E+07	3.5E+07	-	1.9E+08	6.4E+07	3.5E+07	-	
Chloride	7.56	8.6E+05	2.3E+05	2.5E+05	-	-	-	3.5E+08	-	-	-	-	-	-	-	-	-	-	-	-	-	
TRC	0	1.9E+01	1.1E+01	-	-	1.7E+04	1.2E+04	-	-	4.8E+00	2.8E+00	-	-	4.2E+03	3.1E+03	-	-	4.2E+03	3.1E+03	-	-	
Chlorobenzene	0	-	-	6.8E+02	2.1E+04	-	-	9.6E+05	3.0E+07	-	-	6.8E+01	2.1E+03	-	-	9.6E+04	3.0E+06	-	-	9.6E+04	3.0E+06	

Parameter (ug/l unless noted)	Background			Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations						
	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	
Chlorodibromomethane ^c	0	-	-	4.1E+00	3.4E+02	-	-	1.2E+04	9.7E+05	-	-	-	4.1E-01	3.4E+01	-	-	1.2E+03	9.7E+04	-	-	1.2E+03	9.7E+04
Chloroform ^c	0	-	-	3.5E+02	2.9E+04	-	-	1.0E+06	8.3E+07	-	-	-	3.5E+01	2.9E+05	-	-	1.0E+05	8.3E+06	-	-	1.0E+05	8.3E+06
2-Chloronaphthalene	0	-	-	1.7E+03	4.3E+03	-	-	2.4E+06	6.1E+06	-	-	-	1.7E+02	4.3E+02	-	-	2.4E+05	6.1E+05	-	-	2.4E+05	6.1E+05
2-Chlorophenol	0	-	-	1.2E+02	4.0E+02	-	-	1.7E+05	5.6E+05	-	-	-	1.2E+01	4.0E+01	-	-	1.7E+04	5.6E+04	-	-	1.7E+04	5.6E+04
Chlorpyrifos	0	8.3E-02	4.1E-02	-	-	7.4E+01	4.6E+01	-	-	2.1E-02	1.0E-02	-	-	-	1.9E+01	1.1E+01	-	-	1.9E+01	1.1E+01	-	-
Chromium III	0	4.6E+02	5.9E+01	-	-	4.1E+05	6.6E+04	-	-	1.1E+02	1.5E+01	-	-	-	1.0E+05	1.7E+04	-	-	1.0E+05	1.7E+04	-	-
Chromium VI	0	1.6E+01	1.1E+01	-	-	1.4E+04	1.2E+04	-	-	4.0E+00	2.8E+00	-	-	-	3.6E+03	3.1E+03	-	-	3.6E+03	3.1E+03	-	-
Chromium, Total	0.18	-	-	1.0E+02	-	-	-	1.4E+05	-	-	-	-	1.0E+01	-	-	-	1.4E+04	-	-	-	-	-
Chrysene ^c	0	-	-	4.4E-02	4.9E-01	-	-	1.3E+02	1.4E+03	-	-	-	4.4E-03	4.9E-02	-	-	1.3E+01	1.4E+02	-	-	1.3E+01	1.4E+02
Copper	0.65	1.0E+01	7.1E+00	1.3E+03	-	8.7E+03	7.2E+03	1.8E+06	-	3.1E+00	2.3E+00	1.3E+02	-	2.2E+03	1.8E+03	1.8E+05	-	2.2E+03	1.8E+03	1.8E+05	-	2.2E+03
Cyanide	0	2.2E+01	5.2E+00	7.0E+02	2.2E+05	2.0E+04	5.8E+03	9.9E+05	3.0E+08	5.5E+00	1.3E+00	7.0E+01	2.2E+04	4.9E+03	1.5E+03	9.9E+04	3.0E+07	4.9E+03	1.5E+03	9.9E+04	3.0E+07	
DDD ^c	0	-	-	8.3E-03	8.4E-03	-	-	2.4E+01	2.4E+01	-	-	8.3E-04	8.4E-04	-	-	2.4E+00	2.4E+00	-	-	2.4E+00	2.4E+00	
DDE ^c	0	-	-	5.9E-03	5.9E-03	-	-	1.7E+01	1.7E+01	-	-	5.9E-04	5.9E-04	-	-	1.7E+00	1.7E+00	-	-	1.7E+00	1.7E+00	
DDT ^c	0	1.1E+00	1.0E-03	5.9E-03	5.9E-03	9.8E+02	1.1E+00	1.7E+01	1.7E+01	2.8E-01	2.5E-04	5.9E-04	5.9E-04	2.8E+02	2.8E-01	1.7E+00	1.7E+00	2.8E+02	2.8E-01	1.7E+00	1.7E+00	
Demeton	0	-	-	1.0E-01	-	-	-	1.1E+02	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene ^c	0	-	-	4.4E-02	4.9E-01	-	-	1.3E+02	1.4E+03	-	-	4.4E-03	4.9E-02	-	-	1.3E+01	1.4E+02	-	-	1.3E+01	1.4E+02	
Dibutyl phthalate	0	-	-	2.7E+03	1.2E+04	-	-	3.8E+06	1.7E+07	-	-	2.7E+02	1.2E+03	-	-	3.8E+05	1.7E+06	-	-	3.8E+05	1.7E+06	
Dichloromethane	0	-	-	4.7E+01	1.6E+04	-	-	1.3E+05	4.6E+07	-	-	4.7E+00	1.6E+03	-	-	1.3E+04	4.6E+06	-	-	1.3E+04	4.6E+06	
(Methylene Chloride) ^c	0	-	-	2.7E+03	1.7E+04	-	-	3.8E+06	2.4E+07	-	-	2.7E+02	1.7E+03	-	-	3.8E+05	2.4E+06	-	-	3.8E+05	2.4E+06	
1,2-Dichlorobenzene	0	-	-	4.0E-02	2.6E+03	-	-	5.6E+05	3.7E+06	-	-	4.0E+01	2.6E+02	-	-	5.6E+04	3.7E+05	-	-	5.6E+04	3.7E+05	
1,3-Dichlorobenzene	0	-	-	4.0E-02	2.6E+03	-	-	5.6E+05	3.7E+06	-	-	4.0E+01	2.6E+02	-	-	5.6E+04	3.7E+05	-	-	5.6E+04	3.7E+05	
1,4-Dichlorobenzene	0	-	-	4.0E-02	2.6E+03	-	-	5.6E+05	3.7E+06	-	-	4.0E+01	2.6E+02	-	-	5.6E+04	3.7E+05	-	-	5.6E+04	3.7E+05	
3,3-Dichlorobenzidine ^c	0	-	-	4.0E-01	7.7E-01	-	-	1.1E+03	2.2E+03	-	-	4.0E-02	7.7E-02	-	-	1.1E+02	2.2E+02	-	-	1.1E+02	2.2E+02	
Dichloromethane ^c	0	-	-	5.6E+00	4.6E+02	-	-	1.6E+04	1.3E+06	-	-	5.6E-01	4.6E+01	-	-	1.6E+03	1.3E+05	-	-	1.6E+03	1.3E+05	
1,2-Dichloroethane ^c	0	-	-	3.8E+00	9.9E+02	-	-	1.1E+04	2.8E+06	-	-	3.8E-01	9.9E+01	-	-	1.1E+03	2.8E+05	-	-	1.1E+03	2.8E+05	
1,1-Dichloroethylene	0	-	-	3.1E+02	1.7E+04	-	-	4.4E+05	2.4E+07	-	-	3.1E+01	1.7E+03	-	-	4.4E+04	2.4E+06	-	-	4.4E+04	2.4E+06	
1,2-trans-dichloroethylene	0	-	-	7.0E+02	1.4E+05	-	-	9.9E+05	2.0E+08	-	-	7.0E+01	1.4E+04	-	-	9.9E+04	2.0E+07	-	-	9.9E+04	2.0E+07	
2,4-Dichlorophenol	0	-	-	9.3E+01	7.9E+02	-	-	1.3E+05	1.1E+06	-	-	9.3E+00	7.9E+01	-	-	1.3E+04	1.1E+05	-	-	1.3E+04	1.1E+05	
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	-	-	1.0E+02	-	-	-	1.4E+05	-	-	-	-	1.0E+01	-	-	-	1.4E+04	-	-	-	-	
1,3-Dichloropropene	0	-	-	5.2E+00	3.9E+02	-	-	1.5E+04	1.1E+06	-	-	5.2E-01	3.9E+01	-	-	1.5E+03	1.1E+05	-	-	1.5E+03	1.1E+05	
Dieldrin ^c	0	2.4E-01	5.6E-02	1.4E-03	1.4E-03	2.1E+02	6.3E+01	4.0E+00	4.0E+00	6.0E-02	1.4E-02	1.4E-04	1.4E-04	5.4E+01	1.6E+01	4.0E-01	4.0E-01	5.4E+01	1.6E+01	4.0E-01	4.0E-01	
Diethyl Phthalate	0	-	-	2.3E+04	1.2E+05	-	-	3.2E+07	1.7E+08	-	-	2.3E+03	1.2E+04	-	-	3.2E+06	1.7E+07	-	-	3.2E+06	1.7E+07	
Di-2-Ethylhexyl Phthalate ^c	0	-	-	1.8E+01	5.9E+01	-	-	5.1E+04	1.7E+05	-	-	1.8E+00	5.9E+00	-	-	5.1E+03	1.7E+04	-	-	5.1E+03	1.7E+04	
2,4-Dimethylphenol	0	5.4E+02	2.3E+03	-	-	5.4E+01	2.3E+02	3.1E+04	2.9E+05	-	-	5.4E+01	2.3E+02	-	-	7.6E+04	3.2E+05	-	-	7.6E+04	3.2E+05	
Dimethyl Phthalate	0	-	-	3.1E+05	2.9E+06	-	-	4.4E+08	4.1E+09	-	-	3.1E+04	2.9E+05	-	-	4.4E+07	4.1E+08	-	-	4.4E+07	4.1E+08	
Di-n-Butyl Phthalate	0	-	-	2.7E+03	1.2E+04	-	-	3.8E+06	1.7E+07	-	-	2.7E+02	1.2E+03	-	-	3.8E+05	1.7E+06	-	-	3.8E+05	1.7E+06	
2,4-Dinitrophenol	0	-	-	7.0E+01	1.4E+04	-	-	9.9E+04	2.0E+07	-	-	7.0E+00	1.4E+03	-	-	9.9E+03	2.0E+06	-	-	9.9E+03	2.0E+06	
2-Methyl-4,6-Dinitrophenol	0	-	-	1.3E+01	7.6E+02	-	-	1.9E+04	1.1E+06	-	-	1.3E+00	7.7E+01	-	-	1.9E+03	1.1E+05	-	-	1.9E+03	1.1E+05	
2,4-Dinitrotoluene ^c	0	-	-	1.1E+00	9.1E+01	-	-	3.1E+03	2.6E+05	-	-	1.1E-01	9.1E+00	-	-	3.1E+02	2.6E+04	-	-	3.1E+02	2.6E+04	
Dioxin (2,3,7,8-tetrachlorodibenzo-p-dioxin) (ppq)	0	-	-	1.2E-06	1.2E-06	-	-	1.2E-06	1.2E-06	-	-	1.2E-07	1.2E-07	-	-	1.2E-07	1.2E-07	-	-	1.2E-07	1.2E-07	
1,2-Diphenylhydrazine ^c	0	-	-	4.0E-01	5.4E+00	-	-	1.1E+03	1.5E+04	-	-	4.0E-02	5.4E-01	-	-	1.1E+02	1.5E+03	-	-	1.1E+02	1.5E+03	
Alpha-Endosulfan	0	2.2E-01	5.6E-02	1.1E+02	2.4E+02	2.0E+02	6.3E+01	1.5E+05	3.4E+05	5.5E-02	1.4E-02	1.1E+01	2.4E+01	4.9E+01	1.6E+01	1.5E+04	3.4E+04	4.9E+01	1.6E+01	1.5E+04	3.4E+04	
Beta-Endosulfan	0	2.2E-01	5.6E-02	1.1E+02	2.4E+02	2.0E+02	6.3E+01	1.5E+05	3.4E+05	5.5E-02	1.4E-02	1.1E+01	2.4E+01	4.9E+01	1.6E+01	1.5E+04	3.4E+04	4.9E+01	1.6E+01	1.5E+04	3.4E+04	
Endosulfan Sulfate	0	-	-	1.1E+02	8.1E+01	-	-	1.5E+05	3.4E+05	-	-	1.5E+01	3.4E+01	-	-	1.5E+04	3.4E+04	-	-	1.5E+04	3.4E+04	
Endrin	0	8.6E-02	3.6E-02	7.9E-01	8.1E-01	7.7E+01	4.0E+01	1.1E+03	1.1E+03	2.2E-02	9.0E-03	7.6E-02	8.1E-02	1.9E+01	1.0E+01	1.1E+02	1.1E+02	1.9E+01	1.0E+01	1.1E+02	1.1E+02	
Endrin Aldehyde	0	-	-	7.9E-01	8.1E-01	-	-	1.1E+03	1.1E+03	-	-	7.6E-02	8.1E-02	-	-	1.1E+02	1.1E+02	-	-	1.1E+02	1.1E+02	

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	-	3.1E+03	2.9E+04	4.1E+07	-	3.1E+02	2.9E+03	-	-	4.4E+05	4.1E+06	-	-	4.4E+05	4.1E+06	-	-	4.4E+05	4.1E+06	
Fluoranthene	0	-	3.0E+02	3.7E+02	5.2E+05	-	3.0E+01	3.7E+01	-	-	4.2E+04	5.2E+04	-	-	4.2E+04	5.2E+04	-	-	4.2E+04	5.2E+04	
Fluorene	0	-	1.3E+03	1.4E+04	2.0E+07	-	1.3E+02	1.4E+03	-	-	1.8E+05	2.0E+06	-	-	1.8E+05	2.0E+06	-	-	1.8E+05	2.0E+06	
Foaming Agents	0	-	5.0E+02	-	7.0E+05	-	5.0E+01	-	-	-	7.0E+04	-	-	-	7.0E+04	-	-	-	7.0E+04	-	
Guthion	0	1.0E-02	-	-	1.1E+01	-	2.5E-03	-	-	-	2.8E+00	-	-	-	2.8E+00	-	-	-	2.8E+00	-	
Heptachlor ^c	0	5.2E-01	3.8E-03	2.1E-03	6.0E+00	4.6E+02	4.3E+00	6.0E+00	1.3E-01	9.5E-04	2.1E-04	2.1E-04	1.2E+02	1.1E+00	6.0E-01	6.0E-01	1.2E+02	1.1E+00	6.0E-01	6.0E-01	
Heptachlor Epoxide ^c	0	5.2E-01	3.8E-03	1.0E-03	3.1E+00	4.6E+02	4.3E+00	2.9E+00	1.3E-01	9.5E-04	1.1E-04	1.1E-04	1.2E+02	1.1E+00	2.9E-01	2.9E-01	1.2E+02	1.1E+00	2.9E-01	2.9E-01	
Hexachlorobenzene ^c	0	-	7.5E-03	7.7E-03	2.2E+01	-	7.5E-04	7.7E-04	-	-	7.5E-04	7.7E-04	-	-	2.1E+00	2.2E+00	-	-	2.1E+00	2.2E+00	
Hexachlorobutadiene ^c	0	-	4.4E+00	5.0E+02	1.4E+06	-	4.4E-01	5.0E+01	-	-	1.3E+03	1.4E+05	-	-	1.3E+03	1.4E+05	-	-	1.3E+03	1.4E+05	
Hexachlorocyclohexane	0	-	3.9E-02	1.3E-01	3.7E+02	-	3.9E-03	1.3E-02	-	-	1.1E+01	3.7E+01	-	-	1.1E+01	3.7E+01	-	-	1.1E+01	3.7E+01	
Alpha-BHC ^c	0	-	1.4E-01	4.6E-01	1.3E+03	-	1.4E-02	4.6E-02	-	-	4.0E+01	1.3E+02	-	-	4.0E+01	1.3E+02	-	-	4.0E+01	1.3E+02	
Beta-BHC ^c	0	-	1.9E-01	6.3E-01	1.8E+03	-	1.9E-02	6.3E-02	-	-	5.4E+01	1.8E+02	-	-	5.4E+01	1.8E+02	-	-	5.4E+01	1.8E+02	
Gamma-BHC ^c (Lindane)	0	9.5E-01	-	2.4E+01	8.5E+02	-	2.4E-01	8.5E+02	-	-	2.4E-01	8.5E+02	-	-	2.4E-01	8.5E+02	-	-	2.4E-01	8.5E+02	
Hexachlorocyclopentadiene	0	-	2.4E+02	1.7E+04	2.4E+07	-	2.4E+01	1.7E+03	-	-	3.4E+04	2.4E+06	-	-	3.4E+04	2.4E+06	-	-	3.4E+04	2.4E+06	
Hexachloroethane ^c	0	-	1.9E+01	8.9E+01	2.5E+05	-	1.9E+00	8.9E+00	-	-	5.4E+04	2.5E+05	-	-	5.4E+03	2.5E+04	-	-	5.4E+03	2.5E+04	
Hydrogen Sulfide	0	2.0E+00	-	4.9E-01	2.2E+03	-	5.0E-01	4.9E-02	-	-	5.0E-01	4.9E-02	-	-	5.6E+02	-	-	-	5.6E+02	-	
Indeno (1,2,3-cd) pyrene ^c	0	-	4.4E-02	4.9E-01	1.4E+03	-	4.4E-03	4.9E-02	-	-	1.3E+01	1.4E+02	-	-	1.3E+01	1.4E+02	-	-	1.3E+01	1.4E+02	
Iron	0	-	3.0E+02	-	4.2E+05	-	3.0E+01	-	-	-	4.2E+04	-	-	-	4.2E+04	-	-	-	4.2E+04	-	
Isophorone ^c	0	-	3.6E+02	2.6E+04	7.4E+07	-	3.6E+01	2.6E+03	-	-	1.0E+06	7.4E+07	-	-	1.0E+05	7.4E+06	-	-	1.0E+05	7.4E+06	
Kepon ^c	0	0.0E+00	-	0.0E+00	0.0E+00	-	0.0E+00	0.0E+00	-	-	0.0E+00	0.0E+00	-	-	0.0E+00	0.0E+00	-	-	0.0E+00	0.0E+00	
Lead	0	8.4E+01	9.5E+00	1.5E+01	7.5E+04	1.1E+04	1.1E+04	2.1E+04	2.1E+01	2.4E+00	1.5E+00	1.5E+00	1.9E+04	2.7E+03	2.1E+03	2.1E+03	1.9E+04	2.7E+03	2.1E+03	2.1E+03	
Malathion	0	-	1.0E-01	-	1.1E+02	-	1.8E-01	-	-	-	5.0E+04	-	-	-	5.0E+03	-	-	-	5.0E+03	-	
Manganese	14.32	-	5.0E+01	-	5.0E+04	-	5.0E+01	-	-	-	5.0E+04	-	-	-	5.0E+03	-	-	-	5.0E+03	-	
Mercury	0	1.4E+00	7.7E-01	5.0E-02	1.3E+03	8.6E+02	7.0E+01	7.2E+01	3.5E-01	1.9E-01	5.0E-03	5.1E-03	3.1E+02	2.2E+02	7.0E+00	7.2E+00	3.1E+02	2.2E+02	7.0E+00	7.2E+00	
Methyl Bromide	0	-	4.8E+01	4.0E+03	5.6E+06	-	4.8E+00	4.0E+02	-	-	6.8E+04	5.6E+06	-	-	6.8E+03	5.6E+05	-	-	6.8E+03	5.6E+05	
Methoxychlor	0	-	3.0E-02	1.0E+02	1.4E+05	-	3.4E+01	1.4E+05	-	-	1.4E+05	-	-	-	1.4E+04	-	-	-	1.4E+04	-	
Mirex	0	0.0E+00	-	6.8E+02	2.1E+04	-	0.0E+00	6.8E+01	-	-	9.6E+05	3.0E+07	-	-	9.6E+04	3.0E+06	-	-	9.6E+04	3.0E+06	
Monochlorobenzene	0	-	1.6E+01	4.6E+03	6.5E+06	-	1.6E+01	4.6E+02	-	-	8.6E+05	6.5E+06	-	-	8.6E+04	6.5E+05	-	-	8.6E+04	6.5E+05	
Nickel	0.39	1.4E+02	1.6E+01	6.1E+02	1.3E+05	1.8E+04	1.8E+04	6.5E+06	3.6E+01	4.3E+00	6.1E+01	4.6E+02	3.2E+04	4.4E+03	6.5E+05	6.5E+05	3.2E+04	4.4E+03	6.5E+05	6.5E+05	
Nitrate (as N)	0.87	-	1.0E+04	-	1.4E+07	-	1.0E+03	-	-	-	1.4E+06	-	-	-	1.4E+06	-	-	-	1.4E+06	-	
Nitrobenzene	0	-	1.7E+01	1.9E+03	2.4E+04	-	1.7E+00	1.9E+02	-	-	2.4E+03	2.7E+05	-	-	2.4E+03	2.7E+05	-	-	2.4E+03	2.7E+05	
N-Nitrosodimethylamine ^c	0	-	6.9E-03	8.1E+01	2.3E+05	-	6.9E-04	8.1E+00	-	-	2.0E+00	2.3E+04	-	-	2.0E+00	2.3E+04	-	-	2.0E+00	2.3E+04	
N-Nitrosodiphenylamine ^c	0	-	5.0E+01	1.6E+02	4.6E+05	-	5.0E+00	1.6E+01	-	-	1.4E+04	4.6E+04	-	-	1.4E+04	4.6E+04	-	-	1.4E+04	4.6E+04	
N-Nitrosodi-n-propylamine ^c	0	-	5.0E-02	1.4E+01	4.0E+04	-	5.0E-03	1.4E+00	-	-	1.4E+01	4.0E+03	-	-	1.4E+01	4.0E+03	-	-	1.4E+01	4.0E+03	
Parathion	0	6.5E-02	1.3E-02	-	5.8E+01	1.5E+01	1.6E-02	3.3E-03	1.6E-02	3.3E-03	3.3E-03	3.3E-03	1.5E+01	3.6E+00	3.6E+00	3.6E+00	1.5E+01	3.6E+00	3.6E+00	3.6E+00	
PCB-1016	0	-	1.4E-02	-	1.6E+01	-	1.6E+01	-	-	-	1.6E+01	-	-	-	1.6E+01	-	-	-	1.6E+01	-	
PCB-1221	0	-	1.4E-02	-	1.6E+01	-	1.6E+01	-	-	-	1.6E+01	-	-	-	1.6E+01	-	-	-	1.6E+01	-	
PCB-1232	0	-	1.4E-02	-	1.6E+01	-	1.6E+01	-	-	-	1.6E+01	-	-	-	1.6E+01	-	-	-	1.6E+01	-	
PCB-1242	0	-	1.4E-02	-	1.6E+01	-	1.6E+01	-	-	-	1.6E+01	-	-	-	1.6E+01	-	-	-	1.6E+01	-	
PCB-1248	0	-	1.4E-02	-	1.6E+01	-	1.6E+01	-	-	-	1.6E+01	-	-	-	1.6E+01	-	-	-	1.6E+01	-	
PCB-1254	0	-	1.4E-02	-	1.6E+01	-	1.6E+01	-	-	-	1.6E+01	-	-	-	1.6E+01	-	-	-	1.6E+01	-	
PCB-1260	0	-	1.4E-02	-	1.6E+01	-	1.6E+01	-	-	-	1.6E+01	-	-	-	1.6E+01	-	-	-	1.6E+01	-	
PCB Total ^c	0	-	1.7E-03	1.7E-03	4.9E+00	-	1.7E-04	1.7E-04	-	-	4.9E+00	4.9E+00	-	-	4.9E-01	4.9E-01	-	-	4.9E-01	4.9E-01	

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	Acute	Chronic	HH (PWS)	Acute	Chronic	HH (PWS)	Acute	Chronic	HH (PWS)	Acute	Chronic	HH (PWS)	
Pentachlorophenol ^c	0	1.2E+01	9.0E+00	2.8E+00	8.2E+01	1.1E+04	1.0E+04	8.0E+03	2.3E+05	2.9E+00	2.3E+00	2.8E-01	2.8E+00	2.8E+03	2.5E+03	2.6E+03	2.3E+04
Phenol	0	-	2.1E+04	4.6E+06	4.6E+06	3.0E+07	3.0E+07	6.5E+09	2.1E+03	-	2.1E+03	2.1E+03	2.1E+03	2.1E+03	2.1E+03	2.1E+03	2.1E+03
Pyrene	0	-	9.6E+02	1.1E+04	1.1E+04	1.4E+06	1.4E+06	1.5E+07	9.8E+01	-	9.8E+01	9.8E+01	9.8E+01	9.8E+01	9.8E+01	9.8E+01	9.8E+01
Radionuclides (pCi/l except Beta/Photon)	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gross Alpha Activity (nrem/yr)	0	-	1.5E+01	1.5E+01	1.5E+01	2.1E+04	2.1E+04	2.1E+04	1.5E+00	-	1.5E+00	1.5E+00	1.5E+00	1.5E+00	1.5E+00	1.5E+00	1.5E+00
Beta and Photon Activity	0	-	4.0E+00	4.0E+00	4.0E+00	5.6E+03	5.6E+03	5.6E+03	4.0E-01	-	4.0E-01	4.0E-01	4.0E-01	4.0E-01	4.0E-01	4.0E-01	4.0E-01
Strontium-90	0	-	8.0E+00	8.0E+00	8.0E+00	1.1E+04	1.1E+04	1.1E+04	8.0E-01	-	8.0E-01	8.0E-01	8.0E-01	8.0E-01	8.0E-01	8.0E-01	8.0E-01
Tritium	0	-	2.0E+04	2.0E+04	2.0E+04	2.8E+07	2.8E+07	2.8E+07	2.0E+03	-	2.0E+03	2.0E+03	2.0E+03	2.0E+03	2.0E+03	2.0E+03	2.0E+03
Selenium	0	2.0E+01	5.0E+00	1.7E+02	1.1E+04	1.8E+04	5.6E+03	2.4E+05	1.5E+07	5.0E+00	1.3E+00	1.7E+01	1.1E+03	4.8E+03	1.4E+03	4.8E+03	1.5E+06
Silver	0	2.2E+00	-	-	-	1.9E+03	-	-	-	5.4E-01	-	-	-	4.8E+02	-	4.8E+02	-
Sulfate	7.71	-	2.5E+05	-	-	-	-	3.5E+08	-	-	-	2.5E+04	-	-	-	-	3.5E+07
1,1,2,2-Tetrachloroethane ^c	0	-	1.7E+00	1.1E+02	1.1E+02	4.9E+03	3.1E+05	3.1E+05	1.1E+01	-	1.7E-01	1.1E+01	-	-	-	-	4.9E+02
Tetrachloroethylene ^c	0	-	8.0E+00	8.9E+01	8.9E+01	2.3E+04	2.5E+05	2.5E+05	8.9E+00	-	8.0E-01	8.9E+00	-	-	-	-	2.3E+03
Thallium	0	-	1.7E+00	6.3E+00	6.3E+00	2.4E+03	8.9E+03	8.9E+03	1.7E-01	-	1.7E-01	6.3E-01	-	-	-	-	2.4E+02
Toluene	0	-	6.8E+03	2.0E+05	2.0E+05	9.8E+06	2.8E+08	2.8E+08	6.8E+02	-	6.8E+02	2.0E+04	-	-	-	-	9.8E+05
Total dissolved solids	0	-	5.0E+05	-	-	7.0E+08	-	-	5.0E+04	-	5.0E+04	-	-	-	-	-	7.0E+07
Toxaphene ^c	0	7.3E-01	2.0E-04	7.3E-03	7.5E-03	6.5E+02	2.2E-01	2.1E+01	2.1E+01	1.8E-01	5.0E-05	7.3E-04	7.5E-04	1.8E+02	5.6E-02	1.8E+02	2.1E+00
Tributyltin	0	4.6E-01	6.3E-02	-	-	4.1E+02	7.0E+01	-	-	1.2E-01	1.6E-02	-	-	1.0E+02	1.8E+01	1.0E+02	2.1E+00
1,2,4-Trichlorobenzene	0	-	2.6E-02	9.4E+02	9.4E+02	3.7E+05	1.3E+06	1.3E+06	2.6E+01	-	2.6E+01	9.4E+01	-	-	-	-	3.7E+04
1,1,2-Trichloroethane ^c	0	-	6.0E+00	4.2E+02	4.2E+02	1.7E+04	1.2E+06	1.2E+06	6.0E-01	-	6.0E-01	4.2E+01	-	-	-	-	1.7E+03
Trichloroethylene ^c	0	-	2.7E+01	8.1E+02	8.1E+02	7.7E+04	2.3E+06	2.3E+06	2.7E+00	-	2.7E+00	8.1E+01	-	-	-	-	7.7E+03
2,4,6-Trichlorophenol ^c	0	-	2.1E+01	6.8E+01	6.8E+01	6.0E+04	1.9E+05	1.9E+05	2.1E+00	-	2.1E+00	6.8E+00	-	-	-	-	6.0E+03
2-(2,4,5-Trichlorophenoxy)propionic acid (Silvex)	0	-	5.0E+01	-	-	7.0E+04	-	-	5.0E+00	-	5.0E+00	-	-	-	-	-	7.0E+03
Vinyl Chloride ^c	0	-	2.3E-01	6.1E+01	6.1E+01	6.8E+02	1.7E+05	1.7E+05	2.3E-02	-	2.3E-02	6.1E+00	-	-	-	-	6.6E+01
Zinc	3.68	9.3E+01	9.4E+01	9.1E+03	6.9E+04	8.0E+04	1.0E+05	1.3E+07	9.7E+07	2.6E+01	2.6E+01	9.1E+02	6.9E+03	2.0E+04	2.5E+04	2.0E+04	1.3E+06

Metal	Target Value (SSTV)
Antimony	2.0E+03
Arsenic	1.4E+03
Barium	2.8E+05
Cadmium	1.5E+02
Chromium III	9.9E+03
Chromium VI	1.4E+03
Copper	8.7E+02
Iron	4.2E+04
Lead	1.6E+03
Manganese	5.0E+03
Mercury	7.0E+00
Nickel	2.6E+03
Selenium	8.4E+02
Silver	1.9E+02
Zinc	8.0E+03

Note: do not use QL's lower than the minimum QL's provided in agency guidance

Notes:

- All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
- Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
- Metals measured as Dissolved, unless specified otherwise
- "C" indicates a carcinogenic parameter
- Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information. Antidegradation WLAs are based upon a complete mix.

$$= (0.1(WQC - \text{background conc.}) + \text{background conc.}) \text{ for acute and chronic}$$

$$= (0.1(WQC - \text{background conc.}) + \text{background conc.}) \text{ for human health}$$
- WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens, Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

FRESHWATER WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Claytor Hydroelectric Plant Outfalls 005-008

Permit No.: VA000087084

Receiving Stream: New River

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		Stream Flows		Mixing Information		Effluent Information	
Mean Hardness (as CaCO3) =	76 mg/L	1Q10 (Annual) =	357 MGD	Annual - 1Q10 Mix =	100 %	Mean Hardness (as CaCO3) =	76 mg/L
90% Temperature (Annual) =	23.9 deg C	7Q10 (Annual) =	447 MGD	- 7Q10 Mix =	100 %	90% Temp (Annual) =	18.7 deg C
90% Temperature (Wet season) =	13.9 deg C	30Q10 (Annual) =	506 MGD	- 30Q10 Mix =	100 %	90% Temp (Wet season) =	13.2 deg C
90% Maximum pH =	8.2 SU	1Q10 (Wet season) =	404 MGD	Wet Season - 1Q10 Mix =	100 %	90% Maximum pH =	7.4 SU
10% Maximum pH =	7.3 SU	30Q10 (Wet season)	812 MGD	- 30Q10 Mix =	100 %	10% Maximum pH =	7.2 SU
Tier Designation (1 or 2) =	2	30Q5 =	563 MGD			Discharge Flow =	0.3 MGD
Public Water Supply (PWS) Y/N? =	Y	Harmonic Mean =	1144 MGD				
Trout Present Y/N? =	N	Annual Average =	MGD				
Early Life Stages Present Y/N? =	Y						

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenaphthene	0	-	-	1.2E+03	2.7E+03	-	-	2.3E+06	5.1E+06	-	-	1.2E+02	2.7E+02	-	-	2.3E+05	5.1E+05	-	-	2.3E+05	5.1E+05
Acrolein	0	-	-	3.2E+02	7.8E+02	-	-	6.0E+05	1.5E+06	-	-	3.2E+01	7.8E+01	-	-	6.0E+04	1.5E+05	-	-	6.0E+04	1.5E+05
Acrylonitrile ^c	0	-	-	5.9E-01	6.8E+00	-	-	2.3E+03	2.5E+04	-	-	5.9E-02	6.6E-01	-	-	2.3E+02	2.5E+03	-	-	2.3E+02	2.5E+03
Aldrin ^c	0	3.0E+00	-	1.3E-03	1.4E-03	3.6E+03	5.0E+00	5.0E+00	5.3E+00	7.6E-01	-	1.3E-04	1.4E-04	8.9E+02	-	5.0E-01	5.3E-01	8.9E+02	-	5.0E-01	5.3E-01
Ammonia-N (mg/l)	0.02	5.75E+00	1.04E+00	-	-	6.8E+03	1.7E+03	-	-	1.45E+00	2.75E-01	-	-	1.7E+03	4.3E+02	-	-	1.7E+03	4.3E+02	-	-
Ammonia-N (mg/l) (High Flow)	0.02	5.75E+00	1.80E+00	-	-	7.7E+03	4.8E+03	-	-	1.45E+00	4.64E-01	-	-	1.9E+03	1.2E+03	-	-	1.9E+03	1.2E+03	-	-
Anthracene	0	-	-	9.6E+03	1.1E+05	-	-	1.8E+07	2.1E+08	-	-	9.6E+02	1.1E+04	-	-	1.8E+06	2.1E+07	-	-	1.8E+06	2.1E+07
Antimony	0	-	-	1.4E+01	4.3E+03	-	-	2.6E+04	8.1E+06	-	-	1.4E+00	4.3E+02	-	-	2.6E+03	8.1E+05	-	-	2.6E+03	8.1E+05
Arsenic	0.35	3.4E+02	1.5E+02	1.0E+01	-	4.0E+05	2.2E+05	1.8E+04	-	8.5E+01	3.8E+01	1.3E+00	-	1.0E+05	5.6E+04	1.0E+05	5.6E+04	1.0E+05	5.6E+04	1.0E+05	5.6E+04
Barium	0	-	-	2.0E+03	-	-	-	3.8E+06	-	-	-	2.0E+02	-	-	-	3.8E+05	-	-	-	3.8E+05	-
Benzene ^c	0	-	-	1.2E+01	7.1E+02	-	-	4.6E+04	2.7E+06	-	-	1.2E+00	7.1E+01	-	-	4.6E+03	2.7E+05	-	-	4.6E+03	2.7E+05
Benzidine ^c	0	-	-	1.2E-03	5.4E-03	-	-	4.6E+00	2.1E+01	-	-	1.2E-04	5.4E-04	-	-	4.6E-01	2.1E+00	-	-	4.6E-01	2.1E+00
Benzo (a) anthracene ^c	0	-	-	4.4E-02	4.9E-01	-	-	1.7E+02	1.9E+03	-	-	4.4E-03	4.9E-02	-	-	1.7E+01	1.9E+02	-	-	1.7E+01	1.9E+02
Benzo (b) fluoranthene ^c	0	-	-	4.4E-02	4.9E-01	-	-	1.7E+02	1.9E+03	-	-	4.4E-03	4.9E-02	-	-	1.7E+01	1.9E+02	-	-	1.7E+01	1.9E+02
Benzo (k) fluoranthene ^c	0	-	-	4.4E-02	4.9E-01	-	-	1.7E+02	1.9E+03	-	-	4.4E-03	4.9E-02	-	-	1.7E+01	1.9E+02	-	-	1.7E+01	1.9E+02
Benzo (a) pyrene ^c	0	-	-	4.4E-02	4.9E-01	-	-	1.7E+02	1.9E+03	-	-	4.4E-03	4.9E-02	-	-	1.7E+01	1.9E+02	-	-	1.7E+01	1.9E+02
Bis(2-Chloroethyl) Ether	0	-	-	3.1E-01	1.4E+01	-	-	5.8E+02	2.6E+04	-	-	3.1E-02	1.4E+00	-	-	5.8E+01	2.6E+03	-	-	5.8E+01	2.6E+03
Bis(2-Chloroisopropyl) Ether	0	-	-	1.4E+03	1.7E+05	-	-	2.6E+06	3.2E+08	-	-	1.4E+00	3.6E+02	-	-	2.6E+05	3.2E+07	-	-	2.6E+05	3.2E+07
Bromoform ^c	0	-	-	4.4E+01	3.6E+03	-	-	1.7E+05	1.4E+07	-	-	4.4E+00	3.6E+02	-	-	1.7E+04	1.4E+06	-	-	1.7E+04	1.4E+06
Butylbenzophthalate	0	-	-	3.0E+03	5.2E+03	-	-	5.6E+06	9.8E+06	-	-	3.0E+02	5.2E+02	-	-	5.6E+05	9.8E+05	-	-	5.6E+05	9.8E+05
Cadmium	0	2.9E+00	9.1E-01	5.0E+00	-	3.4E+03	1.4E+03	9.4E+03	-	7.2E-01	2.3E-01	5.0E-01	-	8.6E+02	3.4E+02	8.6E+02	3.4E+02	8.6E+02	3.4E+02	8.6E+02	3.4E+02
Carbon Tetrachloride ^c	0	-	-	2.5E+00	4.4E+01	-	-	9.5E+03	1.7E+05	-	-	2.5E-01	4.4E+00	-	-	9.5E+02	1.7E+04	-	-	9.5E+02	1.7E+04
Chlordane ^c	0	2.4E+00	4.3E-03	2.1E-02	2.2E-02	2.9E+03	6.4E+00	8.0E+01	8.4E+01	6.0E-01	1.1E-03	2.1E-03	2.2E-03	7.1E+02	1.6E+00	8.0E+00	8.4E+00	7.1E+02	1.6E+00	8.0E+00	8.4E+00
Chloride	7.56	8.6E+05	2.3E+05	2.5E+05	-	1.0E+09	3.4E+08	4.7E+08	-	2.2E+05	5.8E+04	2.5E+04	-	2.6E+08	8.6E+07	4.7E+07	-	2.6E+08	8.6E+07	4.7E+07	-
TRC	0	1.9E+01	1.1E+01	-	-	2.3E+04	1.6E+04	-	-	4.8E+00	2.8E+00	-	-	5.7E+03	4.1E+03	-	-	5.7E+03	4.1E+03	-	-
Chlorobenzene	0	-	-	6.8E+02	2.1E+04	-	-	1.3E+06	3.9E+07	-	-	6.8E+01	2.1E+03	-	-	1.3E+05	3.9E+06	-	-	1.3E+05	3.9E+06

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
		Acute	Chronic	HH (PWS)	Acute	Chronic	HH (PWS)	Acute	Chronic	HH (PWS)	Acute	Chronic	HH (PWS)	Acute	Chronic	HH (PWS)
Chlorobromomethane ^c	0	-	-	4.1E+00	1.6E+04	1.3E+06	4.1E-01	3.4E+01	-	-	1.6E+03	1.3E+05	-	-	1.6E+03	1.3E+05
Chloroform ^c	0	-	-	3.5E+02	1.3E+06	1.1E+08	3.6E+01	2.9E+03	-	-	1.3E+05	1.1E+07	-	-	1.3E+05	1.1E+07
2-Chloronaphthalene	0	-	-	1.7E+03	3.2E+06	8.1E+06	1.7E+02	4.3E+02	-	-	3.2E+05	8.1E+05	-	-	3.2E+05	8.1E+05
2-Chlorophenol	0	-	-	1.2E+02	2.3E+05	7.5E+05	1.2E+01	4.0E+01	-	-	2.3E+04	7.5E+04	-	-	2.3E+04	7.5E+04
Chlorpyrifos	0	8.3E-02	4.1E-02	-	9.9E+01	6.1E+01	2.1E-02	1.0E-02	-	-	1.5E+01	-	2.5E+01	1.5E+01	2.5E+01	1.5E+01
Chromium III	0	4.6E+02	5.9E+01	-	5.4E+05	8.8E+04	1.1E+02	1.5E+01	-	-	2.2E+04	-	1.4E+05	2.2E+04	1.4E+05	2.2E+04
Chromium VI	0	1.6E+01	1.1E+01	-	1.9E+04	1.6E+04	4.0E+00	2.8E+00	-	-	4.1E+03	-	4.8E+03	4.1E+03	4.8E+03	4.1E+03
Chromium, Total	0.18	-	-	1.0E+02	1.9E+05	-	1.0E+01	-	-	-	-	-	-	-	1.9E+04	-
Chrysenes ^c	0	-	-	4.4E-02	1.7E+02	1.9E+03	4.4E-03	4.9E-02	-	-	1.7E+01	1.9E+02	-	-	1.7E+01	1.9E+02
Copper	0.65	1.0E+01	7.1E+00	1.3E+03	1.2E+04	9.6E+03	1.3E+02	1.3E+02	-	-	2.4E+03	2.4E+05	-	-	2.4E+03	2.4E+05
Cyanide	0	2.2E+01	5.2E+00	7.0E+02	2.6E+04	7.8E+03	7.0E+01	2.2E+04	-	-	1.3E+03	1.3E+05	-	-	1.3E+03	1.3E+05
DDD ^c	0	-	-	8.3E-03	3.2E+01	3.2E+01	8.3E-04	8.4E-04	-	-	3.2E+00	3.2E+00	-	-	3.2E+00	3.2E+00
DDE ^c	0	-	-	5.9E-03	2.3E+01	2.3E+01	5.9E-04	5.9E-04	-	-	2.3E+00	2.3E+00	-	-	2.3E+00	2.3E+00
DDT ^c	0	1.1E+00	1.0E-03	5.9E-03	1.3E+03	1.5E+00	2.3E+01	2.3E+01	-	-	3.7E-01	2.3E+00	3.3E+02	3.7E-01	3.3E+02	2.3E+00
Demeton	0	-	1.0E-01	-	1.5E+02	-	2.5E-02	-	-	-	3.7E+01	-	-	3.7E+01	-	-
Dibenz(a,h)anthracene ^c	0	-	-	4.4E-02	1.7E+02	1.9E+03	4.4E-03	4.9E-02	-	-	1.7E+01	1.9E+02	-	-	1.7E+01	1.9E+02
Dibutyl phthalate	0	-	-	2.7E+03	5.1E+06	2.3E+07	2.7E+02	1.2E+03	-	-	5.1E+05	2.3E+06	-	-	5.1E+05	2.3E+06
Dichloromethane	0	-	-	4.7E+01	1.8E+05	6.1E+07	4.7E+00	1.6E+03	-	-	1.8E+04	6.1E+06	-	-	1.8E+04	6.1E+06
(Methylene Chloride) ^c	0	-	-	2.7E+03	5.1E+06	3.2E+07	2.7E+02	1.7E+03	-	-	5.1E+05	3.2E+06	-	-	5.1E+05	3.2E+06
1,2-Dichlorobenzene	0	-	-	4.0E+02	7.5E+05	4.9E+06	4.0E+01	2.6E+02	-	-	7.5E+04	4.9E+05	-	-	7.5E+04	4.9E+05
1,3-Dichlorobenzene	0	-	-	4.0E+02	7.5E+05	4.9E+06	4.0E+01	2.6E+02	-	-	7.5E+04	4.9E+05	-	-	7.5E+04	4.9E+05
1,4-Dichlorobenzene	0	-	-	4.0E+02	7.5E+05	4.9E+06	4.0E+01	2.6E+02	-	-	7.5E+04	4.9E+05	-	-	7.5E+04	4.9E+05
3,3-Dichlorobenzidine ^c	0	-	-	4.0E-01	1.5E+03	2.9E+03	4.0E-02	7.7E-02	-	-	1.5E+02	2.9E+02	-	-	1.5E+02	2.9E+02
Dichlorobromomethane ^c	0	-	-	5.6E+00	2.1E+04	1.8E+06	5.6E-01	4.6E+01	-	-	2.1E+03	1.8E+05	-	-	2.1E+03	1.8E+05
1,2-Dichloroethane ^c	0	-	-	3.8E+00	1.4E+04	3.8E+06	3.8E-01	9.9E+01	-	-	1.4E+03	3.8E+05	-	-	1.4E+03	3.8E+05
1,1-Dichloroethylene	0	-	-	3.1E+02	5.8E+05	3.2E+07	3.1E+01	1.7E+03	-	-	5.8E+04	3.2E+06	-	-	5.8E+04	3.2E+06
1,2-trans-dichloroethylene	0	-	-	7.0E+02	1.3E+06	2.6E+08	7.0E+01	1.4E+04	-	-	1.3E+05	2.6E+07	-	-	1.3E+05	2.6E+07
2,4-Dichlorophenol	0	-	-	9.3E+01	1.7E+05	1.5E+06	9.3E+00	7.9E+01	-	-	1.7E+04	1.5E+05	-	-	1.7E+04	1.5E+05
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	-	1.0E+02	-	1.9E+05	-	1.0E+01	-	-	1.9E+04	-	-	-	1.9E+04	-	-
1,2-Dichloropropane ^c	0	-	-	5.2E+00	2.0E+04	1.5E+06	5.2E+01	3.9E+01	-	-	2.0E+03	1.5E+05	-	-	2.0E+03	1.5E+05
1,3-Dichloropropane	0	-	-	1.0E+01	1.9E+04	3.2E+06	1.0E+00	1.7E+02	-	-	1.9E+03	3.2E+05	-	-	1.9E+03	3.2E+05
Dieldrin ^c	0	2.4E-01	5.6E-02	1.4E-03	2.9E+02	8.3E+01	6.0E-02	1.4E-02	1.4E-04	1.4E-04	5.3E-01	5.3E-01	7.1E+01	2.1E+01	7.1E+01	2.1E+01
Diethyl Phthalate	0	-	-	2.3E+04	4.3E+07	2.3E+08	2.3E+03	1.2E+04	-	-	4.3E+06	2.3E+07	-	-	4.3E+06	2.3E+07
Di-2-Ethylhexyl Phthalate ^c	0	-	-	1.8E+01	6.9E+04	2.3E+05	1.8E+00	5.9E+00	-	-	6.9E+03	2.3E+04	-	-	6.9E+03	2.3E+04
2,4-Dimethylphenol	0	-	-	5.4E+02	1.0E+06	4.3E+06	5.4E+01	2.3E+02	-	-	1.0E+05	4.3E+05	-	-	1.0E+05	4.3E+05
Dimethyl Phthalate	0	-	-	3.1E+05	5.9E+08	5.4E+09	3.1E+04	2.9E+05	-	-	5.9E+07	5.4E+08	-	-	5.9E+07	5.4E+08
Di-n-Butyl Phthalate	0	-	-	2.7E+03	5.1E+06	2.3E+07	2.7E+02	1.2E+03	-	-	5.1E+05	2.3E+06	-	-	5.1E+05	2.3E+06
2,4-Dinitrophenol	0	-	-	7.0E+01	1.3E+05	2.6E+07	7.0E+00	1.4E+03	-	-	1.3E+04	2.6E+06	-	-	1.3E+04	2.6E+06
2-Methyl-4,6-Dinitrophenol	0	-	-	1.3E+01	2.5E+04	1.4E+06	1.3E+00	7.7E+01	-	-	2.5E+03	1.4E+05	-	-	2.5E+03	1.4E+05
2,4-Dinitrotoluene ^c	0	-	-	1.1E+00	4.2E+03	3.5E+05	1.1E-01	9.1E+00	-	-	4.2E+02	3.5E+04	-	-	4.2E+02	3.5E+04
Dioxin (2,3,7,8-tetrachlorodibenzo-p-dioxin) (ppq)	0	-	-	1.2E-06	1.2E-06	1.2E-06	1.2E-07	1.2E-07	-	-	1.2E-07	1.2E-07	-	-	1.2E-07	1.2E-07
1,2-Diphenylhydrazine ^c	0	-	-	4.0E-01	1.5E+03	2.1E+04	4.0E-02	5.4E-01	-	-	1.5E+02	2.1E+03	-	-	1.5E+02	2.1E+03
Alpha-Endosulfan	0	2.2E-01	5.9E-02	1.1E+02	2.6E+02	8.3E+01	2.1E+05	1.4E-02	2.4E+01	2.4E+01	2.1E+04	4.5E+04	6.6E+01	2.1E+01	2.1E+04	4.5E+04
Beta-Endosulfan	0	2.2E-01	5.9E-02	1.1E+02	2.6E+02	8.3E+01	2.1E+05	1.4E-02	2.4E+01	2.4E+01	2.1E+04	4.5E+04	6.6E+01	2.1E+01	2.1E+04	4.5E+04
Endosulfan Sulfate	0	-	-	1.1E+02	2.1E+05	4.5E+05	1.1E+01	2.4E+01	-	-	2.1E+04	4.5E+04	-	-	2.1E+04	4.5E+04
Endrin	0	8.6E-02	3.6E-02	7.6E-01	1.0E+02	5.4E+01	2.2E-02	9.0E-03	7.6E-02	8.1E-02	1.4E+02	1.5E+02	2.6E+01	1.3E+01	2.6E+01	1.4E+02
Endrin Aldehyde	0	-	-	7.6E-01	1.4E+03	1.5E+03	7.6E-02	8.1E-02	-	-	1.4E+02	1.5E+02	-	-	1.4E+02	1.5E+02

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations				
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	
Ethylbenzene	0	-	-	3.1E+03	2.9E+04	-	-	5.8E+06	5.4E+07	-	-	3.1E+02	2.9E+03	-	-	5.8E+05	5.4E+06	-	-	5.8E+05	5.4E+06	
Fluoranthene	0	-	-	3.0E+02	3.7E+02	-	-	5.6E+05	6.9E+05	-	-	3.0E+01	3.7E+01	-	-	5.6E+04	6.9E+04	-	-	5.6E+04	6.9E+04	
Fluorene	0	-	-	1.3E+03	1.4E+04	-	-	2.4E+06	2.6E+07	-	-	1.3E+02	1.4E+03	-	-	2.4E+05	2.6E+06	-	-	2.4E+05	2.6E+06	
Foaming Agents	0	-	-	5.0E+02	-	-	-	9.4E+05	-	-	-	5.0E+01	-	-	-	9.4E+04	-	-	-	-	9.4E+04	-
Guthion	0	-	-	1.0E-02	-	-	-	1.5E+01	-	-	-	2.5E-03	-	-	-	3.7E+00	-	-	-	-	3.7E+00	-
Heptachlor ^c	0	5.2E-01	3.8E-03	2.1E-03	2.1E-03	6.2E+02	5.7E+00	8.0E+00	8.0E+00	1.3E-01	9.5E-04	2.1E-04	2.1E-04	1.5E+02	1.4E+00	8.0E-01	8.0E-01	1.5E+02	1.4E+00	8.0E-01	8.0E-01	
Heptachlor Epoxide ^c	0	5.2E-01	3.8E-03	1.0E-03	1.1E-03	6.2E+02	5.7E+00	3.8E+00	4.2E+00	1.3E-01	9.5E-04	1.0E-04	1.1E-04	1.5E+02	1.4E+00	3.8E-01	4.2E-01	1.5E+02	1.4E+00	3.8E-01	4.2E-01	
Hexachlorobenzene ^c	0	-	-	7.5E-03	7.7E-03	-	-	2.9E+01	2.9E+01	-	-	7.5E-04	7.7E-04	-	-	2.9E+00	2.9E+00	-	-	2.9E+00	2.9E+00	
Hexachlorobutadiene ^c	0	-	-	4.4E+00	5.0E+02	-	-	1.7E+04	1.9E+06	-	-	4.4E-01	5.0E+01	-	-	1.7E+03	1.9E+05	-	-	1.7E+03	1.9E+05	
Hexachlorocyclohexane	0	-	-	3.9E-02	1.3E-01	-	-	1.5E+02	5.0E+02	-	-	3.9E-03	1.3E-02	-	-	1.5E+01	5.0E+01	-	-	1.5E+01	5.0E+01	
Alpha-BHC ^c	0	-	-	1.4E-01	4.6E-01	-	-	5.3E+02	1.8E+03	-	-	1.4E-02	4.6E-02	-	-	5.3E+01	1.8E+02	-	-	5.3E+01	1.8E+02	
Beta-BHC ^c	0	-	-	1.9E-01	6.3E-01	-	-	7.2E+02	2.4E+03	2.4E-01	-	1.9E-02	6.3E-02	2.8E+02	-	7.2E+01	2.4E+02	2.8E+02	-	7.2E+01	2.4E+02	
Hexachlorocyclopentadiene	0	-	-	2.4E+02	1.7E+04	-	-	4.5E+05	3.2E+07	-	-	2.4E+01	1.7E+03	-	-	4.5E+04	3.2E+06	-	-	4.5E+04	3.2E+06	
Hexachloroethane ^c	0	-	-	1.9E+01	8.9E+01	-	-	7.2E+04	3.4E+05	-	-	1.9E+00	8.9E+00	-	-	7.2E+03	3.4E+04	-	-	7.2E+03	3.4E+04	
Hydrogen Sulfide	0	-	-	2.0E+00	-	-	-	3.0E+03	-	-	-	5.0E-01	-	-	-	7.5E+02	-	-	-	7.5E+02	-	
Indeno (1,2,3-cd) pyrene ^c	0	-	-	4.4E-02	4.9E-01	-	-	1.7E+02	1.9E+03	-	-	4.4E-03	4.9E-02	-	-	1.7E+01	1.9E+02	-	-	1.7E+01	1.9E+02	
Iron	0	-	-	3.0E+02	-	-	-	5.6E+05	-	-	-	3.0E+01	-	-	-	5.6E+04	-	-	-	5.6E+04	-	
Isophorone ^c	0	-	-	3.6E+02	2.6E+04	-	-	1.4E+06	9.9E+07	-	-	3.6E+01	2.6E+03	-	-	1.4E+05	9.9E+06	-	-	1.4E+05	9.9E+06	
Kepon	0	-	-	0.0E+00	-	-	-	0.0E+00	-	-	-	0.0E+00	-	-	-	0.0E+00	-	-	-	0.0E+00	-	
Lead	0	8.4E+01	9.5E+00	1.5E+01	-	1.0E+05	1.4E+04	2.8E+04	-	2.1E+01	2.4E+00	1.5E+00	-	2.5E+04	3.6E+03	2.8E+03	-	2.5E+04	3.6E+03	2.8E+03	-	
Malathion	0	-	-	1.0E-01	-	-	-	1.5E+02	-	-	-	2.5E-02	-	-	-	3.7E+01	-	-	-	3.7E+01	-	
Manganese	14.32	-	-	5.0E+01	-	-	-	6.7E+04	-	-	-	1.8E+01	-	-	-	6.7E+03	-	-	-	6.7E+03	-	
Mercury	0	1.4E+00	7.7E-01	5.0E-02	5.1E-02	1.7E+03	1.1E+03	9.4E+01	9.6E+01	3.5E-01	1.9E-01	5.0E-03	5.1E-03	4.2E+02	2.9E+02	9.4E+00	9.6E+00	4.2E+02	2.9E+02	9.4E+00	9.6E+00	
Methyl Bromide	0	-	-	4.8E+01	4.0E+03	-	-	9.0E+04	7.5E+06	-	-	4.8E+00	4.0E+02	-	-	9.0E+03	7.5E+05	-	-	9.0E+03	7.5E+05	
Methoxychlor	0	-	-	3.0E-02	1.0E+02	-	-	4.5E+01	1.9E+05	-	-	7.5E-03	1.0E+01	-	-	1.1E+01	1.9E+04	-	-	1.1E+01	1.9E+04	
Mirex	0	-	-	0.0E+00	-	-	-	0.0E+00	-	-	-	0.0E+00	-	-	-	0.0E+00	-	-	-	0.0E+00	-	
Monochlorobenzene	0	-	-	6.8E+02	2.1E+04	-	-	1.3E+06	3.9E+07	-	-	6.8E+01	2.1E+03	-	-	1.3E+05	3.9E+06	-	-	1.3E+05	3.9E+06	
Nickel	0.39	-	-	1.4E+02	1.6E+01	1.7E+05	2.3E+04	1.1E+06	8.8E+06	3.6E+01	4.3E+00	6.1E+01	4.6E+02	4.3E+04	5.8E+03	1.1E+05	8.6E+05	4.3E+04	5.8E+03	1.1E+05	8.6E+05	
Nitrate (as N)	0.87	-	-	1.0E+04	-	-	-	1.9E+07	-	-	-	1.0E+03	-	-	-	1.9E+06	-	-	-	1.9E+06	-	
Nitrobenzene	0	-	-	1.7E+01	1.9E+03	-	-	3.2E+04	3.6E+06	-	-	1.7E+00	1.9E+02	-	-	3.2E+03	3.6E+05	-	-	3.2E+03	3.6E+05	
N-Nitrosodimethylamine ^c	0	-	-	6.9E-03	8.1E+01	-	-	2.6E+01	3.1E+05	-	-	6.9E-04	8.1E+00	-	-	2.6E+00	3.1E+04	-	-	2.6E+00	3.1E+04	
N-Nitrosodiphenylamine ^c	0	-	-	5.0E+01	1.6E+02	-	-	1.9E+05	6.1E+05	-	-	5.0E+00	1.6E+01	-	-	1.9E+04	6.1E+04	-	-	1.9E+04	6.1E+04	
N-Nitrosodi-n-propylamine ^c	0	-	-	5.0E-02	1.4E+01	-	-	1.9E+02	5.3E+04	-	-	5.0E-03	1.4E+00	-	-	1.9E+01	5.3E+03	-	-	1.9E+01	5.3E+03	
Parathion	0	6.5E-02	1.3E-02	-	-	7.7E+01	1.9E+01	-	-	1.6E-02	3.3E-03	-	-	1.9E+01	4.8E+00	-	-	1.9E+01	4.8E+00	-	-	
PCB-1016	0	-	-	1.4E-02	-	-	-	2.1E+01	-	-	-	3.5E-03	-	-	-	5.2E+00	-	-	-	5.2E+00	-	
PCB-1221	0	-	-	1.4E-02	-	-	-	2.1E+01	-	-	-	3.5E-03	-	-	-	5.2E+00	-	-	-	5.2E+00	-	
PCB-1232	0	-	-	1.4E-02	-	-	-	2.1E+01	-	-	-	3.5E-03	-	-	-	5.2E+00	-	-	-	5.2E+00	-	
PCB-1242	0	-	-	1.4E-02	-	-	-	2.1E+01	-	-	-	3.5E-03	-	-	-	5.2E+00	-	-	-	5.2E+00	-	
PCB-1248	0	-	-	1.4E-02	-	-	-	2.1E+01	-	-	-	3.5E-03	-	-	-	5.2E+00	-	-	-	5.2E+00	-	
PCB-1254	0	-	-	1.4E-02	-	-	-	2.1E+01	-	-	-	3.5E-03	-	-	-	5.2E+00	-	-	-	5.2E+00	-	
PCB-1260	0	-	-	1.4E-02	-	-	-	2.1E+01	-	-	-	3.5E-03	-	-	-	5.2E+00	-	-	-	5.2E+00	-	
PCB Total ^c	0	-	-	1.7E-03	1.7E-03	-	-	6.5E+00	6.5E+00	-	-	1.7E-04	1.7E-04	-	-	6.5E-01	6.5E-01	-	-	6.5E-01	6.5E-01	

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations								
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH					
Pentachlorophenol ^c	0	1.2E+01	9.0E+00	2.8E+00	8.2E+01	1.4E+04	1.3E+04	1.1E+04	3.1E+05	2.9E+00	2.3E+00	2.8E-01	8.2E+00	3.5E+03	3.4E+03	1.1E+03	3.1E+04	3.5E+03	3.4E+03	1.1E+03	3.1E+03	3.1E+04
Phenol	0	-	-	2.1E+04	4.6E+06	-	3.9E+07	8.6E+09	2.1E+03	-	-	2.1E+03	4.6E+05	-	-	3.9E+06	8.6E+08	-	-	3.9E+06	8.6E+08	8.6E+08
Pyrene	0	-	-	9.6E+02	1.1E+04	-	1.8E+06	2.1E+07	9.6E+01	-	-	9.6E+01	1.1E+03	-	-	1.8E+05	2.1E+06	-	-	1.8E+05	2.1E+06	2.1E+06
Radionuclides (pCi/l) except Beta/Photon	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gross Alpha Activity Beta and Photon Activity (mrem/yr)	0	-	-	1.5E+01	1.5E+01	-	2.8E+04	2.8E+04	1.5E+00	-	-	1.5E+00	1.5E+00	-	-	2.8E+03	2.8E+03	-	-	2.8E+03	2.8E+03	2.8E+03
Strontium-90	0	-	-	4.0E+00	4.0E+00	-	7.5E+03	7.5E+03	4.0E-01	-	-	4.0E-01	4.0E-01	-	-	7.5E+02	7.5E+02	-	-	7.5E+02	7.5E+02	7.5E+02
Tritium	0	-	-	8.0E+00	8.0E+00	-	1.5E+04	1.5E+04	8.0E-01	-	-	8.0E-01	8.0E-01	-	-	1.5E+03	1.5E+03	-	-	1.5E+03	1.5E+03	1.5E+03
Selenium	0	2.0E+01	5.0E+00	1.7E+02	1.1E+04	2.4E+04	7.5E+03	3.2E+05	2.1E+07	5.0E+00	1.3E+00	1.7E+01	1.1E+03	6.0E+03	1.9E+03	3.2E+04	2.1E+06	6.0E+03	1.9E+03	3.2E+04	2.1E+06	2.1E+06
Silver	0	2.2E+00	-	-	-	2.6E+03	-	-	-	5.4E-01	-	-	-	6.4E+02	-	-	-	6.4E+02	-	-	-	-
Sulfate	7.71	-	-	2.5E+05	-	-	4.7E+08	-	-	-	-	2.5E+04	-	-	-	-	-	4.7E+07	-	-	-	4.7E+07
1,1,2,2-Tetrachloroethane ^c	0	-	-	1.7E+00	1.1E+02	-	6.5E+03	4.2E+05	-	-	1.7E-01	1.1E+01	-	-	-	-	6.5E+02	4.2E+04	-	-	-	6.5E+02
Tetrachloroethylene ^c	0	-	-	8.0E+00	8.9E+01	-	3.1E+04	3.4E+05	-	-	8.0E-01	8.9E+00	-	-	-	-	3.1E+03	3.4E+04	-	-	-	3.1E+03
Thallium	0	-	-	1.7E+00	6.3E+00	-	3.2E+03	1.2E+04	-	-	1.7E-01	6.3E-01	-	-	-	-	3.2E+02	1.2E+03	-	-	-	3.2E+02
Toluene	0	-	-	6.8E+03	2.0E+05	-	1.3E+07	3.8E+08	-	-	6.8E+02	2.0E+04	-	-	-	-	1.3E+06	3.8E+07	-	-	-	1.3E+06
Total dissolved solids	0	-	-	5.0E+05	-	-	9.4E+08	-	-	-	5.0E+04	-	-	-	-	9.4E+07	-	-	-	-	-	9.4E+07
Toxaphene ^c	0	7.3E-01	2.0E-04	7.3E-03	7.5E-03	8.7E+02	3.0E-01	2.8E+01	2.9E+01	1.8E-01	5.0E-05	7.3E-04	7.5E-04	2.2E+02	7.5E-02	2.8E+00	2.9E+00	2.2E+02	7.5E-02	2.8E+00	2.9E+00	2.9E+00
Tributyltin	0	4.6E-01	6.3E-02	-	-	5.5E+02	9.4E+01	-	-	1.2E-01	1.6E-02	-	-	1.4E+02	2.3E+01	-	-	1.4E+02	2.3E+01	-	-	2.3E+01
1,2,4-Trichlorobenzene	0	-	-	2.6E+02	9.4E+02	-	4.9E+05	1.8E+06	-	-	2.6E+01	9.4E+01	-	-	-	-	4.9E+04	1.8E+05	-	-	-	4.9E+04
1,1,2-Trichloroethane ^c	0	-	-	6.0E+00	4.2E+02	-	2.3E+04	1.6E+06	-	-	6.0E-01	4.2E+01	-	-	-	-	2.3E+03	1.6E+05	-	-	-	2.3E+03
Trichloroethylene ^c	0	-	-	2.7E+01	8.1E+02	-	1.0E+05	3.1E+06	-	-	2.7E+00	8.1E+01	-	-	-	-	1.0E+04	3.1E+05	-	-	-	1.0E+04
2,4,6-Trichlorophenol ^c	0	-	-	2.1E+01	6.5E+01	-	8.0E+04	2.5E+05	-	-	2.1E+00	6.5E+00	-	-	-	-	8.0E+03	2.5E+04	-	-	-	8.0E+03
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	-	-	5.0E+01	-	-	9.4E+04	-	-	-	5.0E+00	-	-	-	-	9.4E+03	-	-	-	-	-	9.4E+03
Vinyl Chloride ^c	0	-	-	2.3E-01	6.1E+01	-	8.8E+02	2.3E+05	-	-	2.3E-02	6.1E+00	-	-	-	8.8E+01	2.3E+04	-	-	-	-	8.8E+01
Zinc	3.68	9.3E+01	9.4E+01	9.1E+03	6.9E+04	1.1E+05	1.3E+05	1.7E+07	1.3E+08	2.6E+01	2.6E+01	9.1E+02	6.9E+03	2.7E+04	3.4E+04	1.7E+06	1.3E+07	2.7E+04	3.4E+04	1.7E+06	1.3E+07	1.3E+07

Notes:

- All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
- Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
- Metals measured as Dissolved, unless specified otherwise
- "C" indicates a carcinogenic parameter
- Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information. Antidegradation WLAs are based upon a complete mix.
- Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
= (0.1(WQC - background conc.) + background conc.) for human health
- WLAs established at the following stream flows: 1Q10 for Acute, 3Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens, Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Metal	Target Value (SSTV)
Antimony	2.6E+03
Arsenic	1.8E+03
Barium	3.8E+05
Cadmium	2.0E+02
Chromium III	1.3E+04
Chromium VI	1.9E+03
Copper	1.2E+03
Iron	5.6E+04
Lead	2.1E+03
Manganese	6.7E+03
Mercury	9.4E+00
Nickel	3.5E+03
Selenium	1.1E+03
Silver	2.6E+02
Zinc	1.1E+04

Note: do not use QL's lower than the minimum QL's provided in agency guidance

FRESHWATER WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Claytor Hydroelectric Plant Outfall 013

Permit No.: VA000087084

Receiving Stream: New River

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		Stream Flows		Mixing Information		Effluent Information	
Mean Hardness (as CaCO ₃) =	76 mg/L	1Q10 (Annual) =	357 MGD	Annual - 1Q10 Mix =	100 %	Mean Hardness (as CaCO ₃) =	76 mg/L
90% Temperature (Annual) =	23 deg C	7Q10 (Annual) =	447 MGD	- 7Q10 Mix =	100 %	90% Temp (Annual) =	19.3 deg C
90% Temperature (Wet season) =	13.9 deg C	30Q10 (Annual) =	506 MGD	- 30Q10 Mix =	100 %	90% Temp (Wet season) =	10.1 deg C
90% Maximum pH =	8.2 SU	1Q10 (Wet season) =	404 MGD	Wet Season - 1Q10 Mix =	100 %	90% Maximum pH =	8.35 SU
10% Maximum pH =	7.3 SU	30Q10 (Wet season) =	812 MGD	- 30Q10 Mix =	100 %	10% Maximum pH =	7.34 SU
Tier Designation (1 or 2) =	2	30Q5 =	563 MGD			Discharge Flow =	0.86 MGD
Public Water Supply (PWS) Y/N? =	Y	Harmonic Mean =	1144 MGD				
Trout Present Y/N? =	N	Annual Average =	MGD				
Early Life Stages Present Y/N? =	Y						

Parameter (ug/l unless noted)	Background Conc.		Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations					
	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH				
Acenaphthene	-	-	1.2E+03	2.7E+03	-	-	7.9E+05	1.8E+06	-	-	1.2E+02	2.7E+02	-	-	7.9E+04	1.8E+05	-	-	7.9E+04	1.8E+05
Acrolein	-	-	3.2E+02	7.8E+02	-	-	2.1E+05	5.1E+05	-	-	3.2E+01	7.8E+01	-	-	2.1E+04	5.1E+04	-	-	2.1E+04	5.1E+04
Acrylonitrile ^c	-	-	5.9E-01	6.8E+00	-	-	7.9E+02	8.8E+03	-	-	5.9E-02	6.6E-01	-	-	7.9E+01	8.8E+02	-	-	7.9E+01	8.8E+02
Aldrin ^c	3.0E+00	-	1.3E-03	1.4E-03	1.2E+03	-	1.7E+00	1.9E+00	7.5E-01	-	1.3E-04	1.4E-04	-	-	1.7E-01	1.9E-01	-	-	1.7E-01	1.9E-01
Ammonia-N (mg/l)	5.72E+00	1.04E+00	-	-	2.4E+03	6.0E+02	-	-	1.45E+00	2.74E-01	-	-	-	-	1.5E+02	-	-	-	5.9E+02	1.5E+02
Ammonia-N (mg/l) (High Flow)	5.72E+00	1.79E+00	-	-	2.7E+03	1.7E+03	-	-	1.45E+00	4.63E-01	-	-	-	-	4.2E+02	-	-	-	6.7E+02	4.2E+02
Anthracene	0	0	9.6E+03	1.1E+05	-	-	6.3E+06	7.2E+07	-	-	9.6E+02	1.1E+04	-	-	6.3E+05	7.2E+06	-	-	6.3E+05	7.2E+06
Antimony	0	0	1.4E+01	4.3E+03	-	-	9.2E+03	2.8E+06	-	-	1.4E+00	4.3E+02	-	-	9.2E+02	2.8E+05	-	-	9.2E+02	2.8E+05
Arsenic	0.35	0	1.0E+01	-	1.4E+05	7.8E+04	6.3E+03	-	8.5E+01	3.8E+01	1.3E+00	-	-	3.5E+04	1.9E+04	6.3E+02	-	-	3.5E+04	1.9E+04
Barium	0	0	2.0E+03	-	-	-	1.3E+06	-	-	-	2.0E+02	-	-	-	-	1.3E+05	-	-	-	-
Benzene ^c	0	0	1.2E+01	7.1E+02	-	-	1.6E+04	9.5E+05	-	-	1.2E+00	7.1E+01	-	-	1.6E+03	9.5E+04	-	-	1.6E+03	9.5E+04
Benzidine ^c	0	0	1.2E-03	5.4E-03	-	-	1.6E+00	7.2E+00	-	-	1.2E-04	5.4E-04	-	-	1.6E-01	7.2E-01	-	-	1.6E-01	7.2E-01
Benzo (a) anthracene ^c	0	0	4.4E-02	4.9E-01	-	-	5.9E+01	6.5E+02	-	-	4.4E-03	4.9E-02	-	-	5.9E+00	6.5E+01	-	-	5.9E+00	6.5E+01
Benzo (b) fluoranthene ^c	0	0	4.4E-02	4.9E-01	-	-	5.9E+01	6.5E+02	-	-	4.4E-03	4.9E-02	-	-	5.9E+00	6.5E+01	-	-	5.9E+00	6.5E+01
Benzo (k) fluoranthene ^c	0	0	4.4E-02	4.9E-01	-	-	5.9E+01	6.5E+02	-	-	4.4E-03	4.9E-02	-	-	5.9E+00	6.5E+01	-	-	5.9E+00	6.5E+01
Benzo (a) pyrene ^c	0	0	4.4E-02	4.9E-01	-	-	5.9E+01	6.5E+02	-	-	4.4E-03	4.9E-02	-	-	5.9E+00	6.5E+01	-	-	5.9E+00	6.5E+01
Bis(2-Chloroethyl) Ether	0	0	3.1E-01	1.4E+01	-	-	2.0E+02	9.2E+03	-	-	3.1E-02	1.4E+00	-	-	2.0E+01	9.2E+02	-	-	2.0E+01	9.2E+02
Bis(2-Chloroisopropyl) Ether	0	0	1.4E+03	1.7E+05	-	-	9.2E+05	1.1E+08	-	-	1.4E+02	1.7E+04	-	-	9.2E+04	1.1E+07	-	-	9.2E+04	1.1E+07
Bromoforn ^c	0	0	4.4E+01	3.8E+03	-	-	5.9E+04	4.8E+06	-	-	4.4E+02	3.6E+02	-	-	5.9E+03	4.8E+05	-	-	5.9E+03	4.8E+05
Butylbenzophthalate	0	0	3.0E+03	5.2E+03	-	-	2.0E+06	3.4E+06	-	-	3.0E+02	5.2E+02	-	-	2.0E+05	3.4E+05	-	-	2.0E+05	3.4E+05
Cadmium	2.9E+00	9.1E-01	5.0E+00	-	1.2E+03	4.8E+02	3.3E+03	-	7.2E-01	2.3E-01	5.0E-01	-	-	3.0E+02	1.2E+02	3.3E+02	-	-	3.0E+02	1.2E+02
Carbon Tetrachloride ^c	0	0	2.5E+00	4.4E+01	-	-	3.5E+03	5.9E+04	-	-	2.5E-01	4.4E+00	-	-	3.5E+02	5.9E+03	-	-	3.5E+02	5.9E+03
Chlordane ^c	0	0	4.3E-03	2.1E-02	1.0E+03	2.2E+00	2.8E+01	2.9E+01	6.0E-01	1.1E-03	2.1E-03	2.2E-03	-	-	2.8E+00	2.9E+00	-	-	2.8E+00	2.9E+00
Chloride	7.56	0	2.3E+05	2.5E+05	3.6E+08	1.2E+08	1.6E+08	-	2.2E+05	5.8E+04	2.5E+04	-	-	8.9E+07	3.0E+07	1.6E+07	-	-	8.9E+07	3.0E+07
TRC	0	0	1.1E+01	-	7.9E+03	5.7E+03	-	-	4.8E+00	2.8E+00	-	-	-	-	1.4E+03	-	-	-	2.0E+03	1.4E+03
Chlorobenzene	0	0	6.8E+02	2.1E+04	-	-	4.5E+05	1.4E+07	-	-	6.8E+01	2.1E+03	-	-	4.5E+04	1.4E+06	-	-	4.5E+04	1.4E+06

Parameter (ug/l unless noted)	Background			Water Quality Criteria						Wasteload Allocations						Antidegradation Baseline						Antidegradation Allocations						Most Limiting Allocations									
	Conc.			Acute		Chronic		HH (PWS)		HH		Acute		Chronic		HH (PWS)		HH		Acute		Chronic		HH (PWS)		HH		Acute		Chronic		HH (PWS)		HH			
Chlorobromomethane ^c	0																																				
Chloroform ^c	0																																				
2-Chloronaphthalene	0																																				
2-Chlorophenol	0																																				
Chloropyrifos	0																																				
Chromium III	0																																				
Chromium VI	0																																				
Chromium, Total	0.18																																				
Chrysene ^c	0																																				
Copper	0.65																																				
Cyanide	0																																				
DDD ^c	0																																				
DDE ^c	0																																				
DDT ^c	0																																				
Demeton	0																																				
Dibenz(a,h)anthracene ^c	0																																				
Dibutyl phthalate	0																																				
Dichloromethane	0																																				
(Methylene Chloride) ^c	0																																				
1,2-Dichlorobenzene	0																																				
1,3-Dichlorobenzene	0																																				
1,4-Dichlorobenzene	0																																				
3,3-Dichlorobenzidine ^c	0																																				
Dichlorobromomethane ^c	0																																				
1,2-Dichloroethane ^c	0																																				
1,1-Dichloroethylene	0																																				
1,2-trans-dichloroethylene	0																																				
2,4-Dichlorophenoxy acetic acid (2,4-D)	0																																				
1,2-Dichloropropane ^c	0																																				
1,3-Dichloropropene	0																																				
Dieldrin ^c	0																																				
Diethyl Phthalate	0																																				
Di-2-Ethylhexyl Phthalate ^c	0																																				
2,4-Dimethylphenol	0																																				
Dimethyl Phthalate	0																																				
Di-n-Butyl Phthalate	0																																				
2,4 Dinitrophenol	0																																				
2-Methyl-4,6-Dinitrophenol	0																																				
2,4-Dinitrotoluene ^c	0																																				
Dioxin (2,3,7,8-tetrachlorodibenzo-p-dioxin) (ppt)	0																																				
1,2-Diphenylhydrazine ^c	0																																				
Alpha-Endosulfan	0																																				
Beta-Endosulfan	0																																				
Endosulfan Sulfate	0																																				
Endrin	0																																				
Endrin Aldehyde	0																																				

Parameter (ug/l unless noted)	Background		Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations						
	Conc.	Acute	HH (PWS)		HH	Acute	HH (PWS)		HH	Acute	Chronic	HH (PWS)		HH	Acute	Chronic	HH (PWS)		HH	Acute	Chronic	HH (PWS)		HH	
			Chronic	HH			Chronic	HH				Chronic	HH				Chronic	HH				Chronic	HH		Chronic
Ethylbenzene	0	-	3.1E+03	2.9E+04	1.9E+07	-	2.0E+06	1.9E+07	2.9E+03	-	3.1E+02	2.9E+03	2.9E+03	-	2.0E+05	1.9E+06	1.9E+06	2.0E+05	1.9E+06	-	2.0E+05	1.9E+06	1.9E+06	2.0E+05	1.9E+06
Fluoranthene	0	-	3.0E+02	3.7E+02	2.4E+05	-	2.0E+05	2.4E+05	3.0E+01	-	3.0E+01	3.7E+01	3.7E+01	-	2.0E+04	2.4E+04	2.4E+04	2.0E+04	2.4E+04	-	2.0E+04	2.4E+04	2.4E+04	2.0E+04	2.4E+04
Fluorene	0	-	1.3E+03	1.4E+04	9.2E+06	-	8.5E+05	9.2E+06	1.3E+02	-	1.3E+02	1.4E+03	1.4E+03	-	8.5E+04	9.2E+05	9.2E+05	8.5E+04	9.2E+05	-	8.5E+04	9.2E+05	9.2E+05	8.5E+04	9.2E+05
Foaming Agents	0	-	5.0E+02	-	-	-	3.3E+05	-	5.0E+01	-	5.0E+01	-	-	-	3.3E+04	-	-	3.3E+04	-	-	-	3.3E+04	-	-	-
Guthion ^c	0	-	1.0E-02	-	-	-	5.2E+00	-	2.5E-03	-	2.5E-03	-	-	-	1.3E+00	-	-	1.3E+00	-	-	-	1.3E+00	-	-	-
Heptachlor ^c	0	5.2E-01	3.8E-03	2.1E-03	2.8E+00	2.2E+02	2.0E+00	2.8E+00	2.1E-04	1.3E-01	9.5E-04	2.1E-04	2.1E-04	5.4E+01	4.9E-01	2.8E-01	2.8E-01	5.4E+01	4.9E-01	2.8E-01	5.4E+01	4.9E-01	2.8E-01	2.8E-01	2.8E-01
Heptachlor Epoxide ^c	0	5.2E-01	3.8E-03	1.1E-03	1.5E+00	2.2E+02	2.0E+00	1.5E+00	1.0E-04	1.3E-01	9.5E-04	1.1E-04	1.1E-04	5.4E+01	4.9E-01	1.3E-01	1.3E-01	5.4E+01	4.9E-01	1.3E-01	5.4E+01	4.9E-01	1.3E-01	1.3E-01	1.3E-01
Hexachlorobenzene ^c	0	-	7.5E-03	7.7E-03	1.0E+01	-	1.0E+01	1.0E+01	7.5E-04	-	7.5E-04	7.7E-04	7.7E-04	-	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0E+00	-	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0E+00
Hexachlorobutadiene ^c	0	-	4.4E+00	5.0E+02	6.7E+05	-	5.9E+03	6.7E+05	4.4E-01	-	4.4E-01	5.0E+01	5.0E+01	-	5.9E+02	6.7E+04	6.7E+04	5.9E+02	6.7E+04	-	5.9E+02	6.7E+04	6.7E+04	5.9E+02	6.7E+04
Hexachlorocyclohexane	0	-	3.9E-02	1.3E-01	1.7E+02	-	5.2E+01	1.7E+02	3.9E-03	-	3.9E-03	1.3E-02	1.3E-02	-	5.2E+00	1.7E+01	1.7E+01	5.2E+00	1.7E+01	-	5.2E+00	1.7E+01	1.7E+01	5.2E+00	1.7E+01
Alpha-BHC ^c	0	-	1.4E-01	4.6E-01	6.1E+02	-	1.9E+02	6.1E+02	1.4E-02	-	1.4E-02	4.6E-02	4.6E-02	-	1.9E+01	6.1E+01	6.1E+01	1.9E+01	6.1E+01	-	1.9E+01	6.1E+01	6.1E+01	1.9E+01	6.1E+01
Beta-BHC ^c	0	-	1.9E-01	6.3E-01	8.4E+02	4.0E+02	-	2.5E+02	8.4E+02	2.4E-01	-	1.9E-02	6.3E-02	9.9E+01	-	2.5E+01	8.4E+01	9.9E+01	2.5E+01	8.4E+01	9.9E+01	2.5E+01	8.4E+01	8.4E+01	8.4E+01
Hexachlorocyclopentadiene	0	-	2.4E+02	1.7E+04	1.1E+07	-	1.6E+05	1.1E+07	2.4E+01	-	2.4E+01	1.7E+03	1.7E+03	-	1.6E+04	1.1E+06	1.1E+06	1.6E+04	1.1E+06	-	1.6E+04	1.1E+06	1.1E+06	1.6E+04	1.1E+06
Hexachloroethane ^c	0	-	1.9E+01	8.9E+01	1.2E+05	-	2.5E+04	1.2E+05	1.9E+00	-	1.9E+00	8.9E+00	8.9E+00	-	2.5E+03	1.2E+04	1.2E+04	2.5E+03	1.2E+04	-	2.5E+03	1.2E+04	1.2E+04	2.5E+03	1.2E+04
Hydrogen Sulfide	0	-	2.0E+00	-	-	-	1.0E+03	-	5.0E-01	-	5.0E-01	-	-	-	2.6E+02	-	-	2.6E+02	-	-	-	2.6E+02	-	-	-
Indeno (1,2,3-cd) pyrene ^c	0	-	4.4E-02	4.9E-01	6.5E+02	-	5.9E+01	6.5E+02	4.4E-03	-	4.4E-03	4.9E-02	4.9E-02	-	5.9E+00	6.5E+01	6.5E+01	4.4E-03	4.9E-02	-	5.9E+00	6.5E+01	6.5E+01	4.4E-03	4.9E-02
Iron	0	-	3.0E+02	-	-	-	2.0E+05	-	3.0E+01	-	3.0E+01	-	-	-	2.0E+04	-	-	2.0E+04	-	-	-	2.0E+04	-	-	-
Isophorone ^c	0	-	3.6E+02	2.6E+04	3.5E+07	-	4.8E+05	3.5E+07	3.6E+01	-	3.6E+01	2.6E+03	2.6E+03	-	4.8E+04	3.5E+06	3.5E+06	3.6E+01	2.6E+03	-	4.8E+04	3.5E+06	3.5E+06	3.6E+01	2.6E+03
Kepon ^c	0	-	0.0E+00	-	-	-	0.0E+00	-	0.0E+00	-	0.0E+00	-	-	-	0.0E+00	-	-	0.0E+00	-	-	-	0.0E+00	-	-	-
Lead	0	8.4E+01	9.5E+00	1.5E+01	9.8E+03	3.5E+04	5.0E+03	9.8E+03	1.5E+00	2.1E+01	1.5E+00	1.5E+00	1.5E+00	8.7E+03	9.8E+02	9.8E+02	8.7E+03	9.8E+02	8.7E+03	9.8E+02	8.7E+03	9.8E+02	9.8E+02	8.7E+03	9.8E+02
Malathion	0	-	1.0E-01	-	-	-	5.2E+01	-	2.5E-02	-	2.5E-02	-	-	-	1.3E+01	-	-	1.3E+01	-	-	-	1.3E+01	-	-	-
Manganese	14.32	-	5.0E+01	-	-	-	2.3E+04	-	5.0E+01	-	5.0E+01	-	-	-	2.4E+03	-	-	2.4E+03	-	-	-	2.4E+03	-	-	-
Mercury	0	1.4E+00	7.7E-01	5.0E-02	5.1E-02	5.8E+02	4.0E+02	3.3E+01	3.3E+01	3.9E-01	1.9E-01	5.0E-03	5.1E-03	1.5E+02	1.0E+02	3.3E+00	3.3E+00	1.5E+02	1.0E+02	1.5E+02	1.0E+02	3.3E+00	3.3E+00	3.3E+00	3.3E+00
Methyl Bromide	0	-	4.8E+01	4.0E+03	2.6E+06	-	3.1E+04	2.6E+06	4.8E+00	-	4.8E+00	4.0E+02	4.0E+02	-	3.1E+03	2.6E+05	2.6E+05	4.8E+00	4.0E+02	-	3.1E+03	2.6E+05	2.6E+05	4.8E+00	4.0E+02
Methoxychlor	0	-	3.0E-02	1.0E+02	-	-	1.6E+01	6.6E+04	7.5E-03	1.0E+01	1.0E+01	-	-	-	3.9E+00	6.6E+03	6.6E+03	3.9E+00	6.6E+03	-	3.9E+00	6.6E+03	6.6E+03	3.9E+00	6.6E+03
Mirex	0	-	0.0E+00	-	-	-	0.0E+00	-	0.0E+00	-	0.0E+00	-	-	-	0.0E+00	-	-	0.0E+00	-	-	-	0.0E+00	-	-	-
Monochlorobenzene	0	-	6.8E+02	2.1E+04	1.4E+07	-	4.5E+05	1.4E+07	6.8E+01	-	6.8E+01	2.1E+03	2.1E+03	-	4.5E+04	1.4E+06	1.4E+06	6.8E+01	2.1E+03	-	4.5E+04	1.4E+06	1.4E+06	6.8E+01	2.1E+03
Nickel	0.39	-	1.6E+01	4.6E+03	3.0E+06	6.0E+04	8.2E+03	4.0E+05	3.0E+06	3.6E+01	4.3E+00	6.1E+01	4.6E+02	1.5E+04	2.0E+03	4.0E+04	3.0E+05	1.5E+04	2.0E+03	4.0E+04	3.0E+05	1.5E+04	2.0E+03	4.0E+04	3.0E+05
Nitrate (as N)	0.87	-	1.0E+04	-	-	-	6.6E+06	-	1.0E+03	-	1.0E+03	-	-	-	6.6E+05	-	-	6.6E+05	-	-	-	6.6E+05	-	-	-
Nitrobenzene	0	-	1.7E+01	1.9E+03	1.2E+06	-	1.1E+04	1.2E+06	1.7E+00	-	1.7E+00	1.9E+02	1.9E+02	-	1.1E+03	1.2E+05	1.2E+05	1.7E+00	1.9E+02	-	1.1E+03	1.2E+05	1.2E+05	1.7E+00	1.9E+02
N-Nitrosodimethylamine ^c	0	-	6.9E-03	8.1E+01	-	-	9.2E+00	1.1E+05	6.9E-04	-	6.9E-04	8.1E+00	8.1E+00	-	9.2E-01	1.1E+04	1.1E+04	6.9E-04	8.1E+00	-	9.2E-01	1.1E+04	1.1E+04	6.9E-04	8.1E+00
N-Nitrosodiphenylamine ^c	0	-	5.0E+01	1.6E+02	-	-	6.7E+04	2.1E+05	5.0E+00	-	5.0E+00	1.6E+01	1.6E+01	-	6.7E+03	2.1E+04	2.1E+04	5.0E+00	1.6E+01	-	6.7E+03	2.1E+04	2.1E+04	5.0E+00	1.6E+01
N-Nitrosodi-n-propylamine ^c	0	-	5.0E-02	1.4E+01	1.9E+04	-	6.7E+01	1.9E+04	5.0E-03	-	5.0E-03	1.4E+00	1.4E+00	-	6.7E+00	1.9E+03	1.9E+03	5.0E-03	1.4E+00	-	6.7E+00	1.9E+03	1.9E+03	5.0E-03	1.4E+00
Parathion	0	6.5E-02	1.3E-02	-	-	2.7E+01	6.8E+00	-	1.6E-02	3.5E-03	3.5E-03	-	-	6.8E+00	1.7E+00	-	-	6.8E+00	1.7E+00	6.8E+00	1.7E+00	1.7E+00	1.7E+00	1.7E+00	1.7E+00
PCB-1016	0	-	1.4E-02	-	-	-	7.3E+00	-	3.5E-03	-	3.5E-03	-	-	1.8E+00	-	-	-	1.8E+00	-	-	-	1.8E+00	-	-	-
PCB-1221	0	-	1.4E-02	-	-	-	7.3E+00	-	3.5E-03	-	3.5E-03	-	-	1.8E+00	-	-	-	1.8E+00	-	-	-	1.8E+00	-	-	-
PCB-1232	0	-	1.4E-02	-	-	-	7.3E+00	-	3.5E-03	-	3.5E-03	-	-	1.8E+00	-	-	-	1.8E+00	-	-	-	1.8E+00	-	-	-
PCB-1242	0	-	1.4E-02	-	-	-	7.3E+00	-	3.5E-03	-	3.5E-03	-	-	1.8E+00	-	-	-	1.8E+00	-	-	-	1.8E+00	-	-	-
PCB-1248	0	-	1.4E-02	-	-	-	7.3E+00	-	3.5E-03	-	3.5E-03	-	-	1.8E+00	-	-	-	1.8E+00	-	-	-	1.8E+00	-	-	-
PCB-1254	0	-	1.4E-02	-	-	-	7.3E+00	-	3.5E-03	-	3.5E-03	-	-	1.8E+00	-	-	-	1.8E+00	-	-	-	1.8E+00	-	-	-
PCB-1260	0	-	1.4E-02	-	-	-	7.3E+00	-	3.5E-03	-	3.5E-03	-	-	1.8E+00	-	-	-	1.8E+00	-	-	-	1.8E+00	-	-	-
PCB Total ^c	0	-	1.7E-03	1.7E-03	2.3E+00	-	7.3E+00	2.3E+00	1.7E-04	-	1.7E-04	1.7E-04	1.7E-04	-	2.3E-01	2.3E-01	2.3E-01	1.7E-04	1.7E-04	-	2.3E-01	2.3E-01	2.3E-01	2.3E-01	2.3E-01

Parameter (ug/l unless noted) c	Background Conc.		Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH		
Pentachlorophenol ^c	1.2E+01	9.0E+00	2.8E+00	8.2E+01	4.9E+03	4.7E+03	3.7E+03	1.1E+05	2.9E+00	2.3E+00	2.8E-01	8.2E+00	1.2E+03	1.2E+03	3.7E+02	1.1E+04	1.2E+03	1.2E+03	3.7E+02	1.1E+04		
Phenol	-	2.1E+04	4.6E+06	4.6E+06	-	1.4E+07	3.0E+09	3.0E+09	-	2.1E+03	4.6E+05	4.6E+05	-	-	1.4E+06	3.0E+08	-	-	1.4E+06	3.0E+08		
Pyrene	-	9.6E+02	1.1E+04	1.1E+04	-	6.3E+05	7.2E+06	7.2E+06	-	9.6E+01	1.1E+03	1.1E+03	-	-	6.3E+04	7.2E+05	-	-	6.3E+04	7.2E+05		
Radionuclides (pCi/l) except Beta/Photon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Gross Alpha Activity Beta and Photon Activity (mrem/yr)	-	1.5E+01	1.5E+01	1.5E+01	-	-	9.8E+03	9.8E+03	-	1.5E+00	1.5E+00	1.5E+00	-	-	9.8E+02	9.8E+02	-	-	9.8E+02	9.8E+02		
Strontium-90	-	4.0E+00	4.0E+00	4.0E+00	-	2.6E+03	2.6E+03	2.6E+03	-	4.0E-01	4.0E-01	4.0E-01	-	-	2.6E+02	2.6E+02	-	-	2.6E+02	2.6E+02		
Tritium	-	8.0E+00	8.0E+00	8.0E+00	-	5.2E+03	5.2E+03	5.2E+03	-	8.0E-01	8.0E-01	8.0E-01	-	-	5.2E+02	5.2E+02	-	-	5.2E+02	5.2E+02		
Selenium	2.0E+01	5.0E+00	1.7E+02	1.1E+04	8.3E+03	2.6E+03	1.1E+05	7.2E+06	5.0E+00	1.3E+00	1.7E+01	1.1E+03	2.1E+03	2.1E+03	1.1E+04	7.2E+05	2.1E+03	6.5E+02	1.1E+04	7.2E+05		
Silver	2.2E+00	-	-	-	9.0E+02	-	-	-	5.4E-01	-	-	-	2.2E+02	2.2E+02	-	-	2.2E+02	-	-	-		
Sulfate	-	2.5E+05	2.5E+05	2.5E+05	-	1.6E+08	1.6E+08	1.6E+08	-	2.5E+04	2.5E+04	2.5E+04	-	-	1.6E+07	1.6E+07	-	-	1.6E+07	1.6E+07		
1,1,2,2-Tetrachloroethane ^c	-	1.7E+00	1.7E+00	1.1E+02	-	2.3E+03	1.5E+05	1.5E+05	-	1.7E-01	1.7E-01	1.1E+01	-	-	2.3E+02	1.5E+04	-	-	2.3E+02	1.5E+04		
Tetrachloroethylene ^c	-	8.0E+00	8.9E+01	8.9E+01	-	1.1E+04	1.2E+05	1.2E+05	-	8.0E-01	8.9E+00	8.9E+00	-	-	1.1E+03	1.2E+04	-	-	1.1E+03	1.2E+04		
Thallium	-	1.7E+00	6.3E+00	6.3E+00	-	1.1E+03	4.1E+03	4.1E+03	-	1.7E-01	6.3E-01	6.3E-01	-	-	1.1E+02	4.1E+02	-	-	1.1E+02	4.1E+02		
Toluene	-	6.8E+03	2.0E+05	2.0E+05	-	4.5E+06	1.3E+08	1.3E+08	-	6.8E+02	2.0E+04	2.0E+04	-	-	4.5E+05	1.3E+07	-	-	4.5E+05	1.3E+07		
Total dissolved solids	-	5.0E+05	-	-	-	3.3E+08	-	-	-	5.0E+04	-	-	-	-	3.3E+07	-	-	-	3.3E+07	-		
Toxaphene ^c	7.3E-01	2.0E-04	7.3E-03	7.3E-03	3.0E+02	1.0E-01	9.7E+00	1.0E+01	1.8E-01	5.0E-05	7.3E-04	7.5E-04	7.5E-04	7.5E-04	9.7E-01	1.0E+00	7.5E-04	2.6E-02	9.7E-01	1.0E+00		
Tributyltin	4.6E-01	6.3E-02	-	-	1.9E+02	3.3E+01	-	-	1.2E-01	1.6E-02	-	-	-	-	-	-	4.8E+01	8.2E+00	4.8E+01	8.2E+00		
1,2,4-Trichlorobenzene	-	2.6E+02	9.4E+02	9.4E+02	-	1.7E+05	6.2E+05	6.2E+05	-	2.6E+01	9.4E+01	9.4E+01	-	-	1.7E+04	6.2E+04	-	-	1.7E+04	6.2E+04		
1,1,2-Trichloroethane ^c	-	6.0E+00	4.2E+02	4.2E+02	-	8.0E+03	5.6E+05	5.6E+05	-	6.0E-01	4.2E+01	4.2E+01	-	-	8.0E+02	5.6E+04	-	-	8.0E+02	5.6E+04		
Trichloroethylene ^c	-	2.7E+01	8.1E+02	8.1E+02	-	3.6E+04	1.1E+06	1.1E+06	-	2.7E+00	8.1E+01	8.1E+01	-	-	3.6E+03	1.1E+05	-	-	3.6E+03	1.1E+05		
2,4,6-Trichlorophenol ^c	-	2.1E+01	6.5E+01	6.5E+01	-	2.8E+04	8.7E+04	8.7E+04	-	2.1E+00	6.5E+00	6.5E+00	-	-	2.8E+03	8.7E+03	-	-	2.8E+03	8.7E+03		
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	-	5.0E+01	-	-	-	3.3E+04	-	-	-	5.0E+00	-	-	-	-	3.3E+03	-	-	-	3.3E+03	-		
Vinyl Chloride ^c	-	2.3E-01	6.1E+01	6.1E+01	-	3.1E+02	8.1E+04	8.1E+04	-	2.3E-02	6.1E+00	6.1E+00	-	-	3.1E+01	8.1E+03	-	-	3.1E+01	8.1E+03		
Zinc	9.3E+01	9.4E+01	9.1E+03	6.9E+04	3.7E+04	4.7E+04	6.0E+06	4.5E+07	2.8E+01	2.8E+01	9.1E+02	6.9E+03	9.3E+03	9.3E+03	6.0E+05	4.5E+06	9.3E+03	1.2E+04	6.0E+05	4.5E+06		

Notes:
1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens, Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Metal	Target Value (SSTV)
Antimony	9.2E+02
Arsenic	6.3E+02
Barium	1.3E+05
Cadmium	7.1E+01
Chromium III	4.6E+03
Chromium VI	6.7E+02
Copper	4.1E+02
Iron	2.0E+04
Lead	7.4E+02
Manganese	2.4E+03
Mercury	3.3E+00
Nickel	1.2E+03
Selenium	3.9E+02
Silver	9.0E+01
Zinc	3.7E+03

Note: do not use QL's lower than the minimum QL's provided in agency guidance

FRESHWATER WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Clayton Hydroelectric Plant Outfall 014

Permit No.: VA000087084

Receiving Stream: New River

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		Stream Flows		Mixing Information		Effluent Information	
Mean Hardness (as CaCO3) =	76 mg/L	1Q10 (Annual) =	357 MGD	Annual - 1Q10 Mix =	100 %	Mean Hardness (as CaCO3) =	76 mg/L
90% Temperature (Annual) =	23 deg C	7Q10 (Annual) =	447 MGD	- 7Q10 Mix =	100 %	90% Temp (Annual) =	19.2 deg C
90% Temperature (Wet season) =	13.9 deg C	30Q10 (Annual) =	506 MGD	- 30Q10 Mix =	100 %	90% Temp (Wet season) =	11.4 deg C
90% Maximum pH =	8.2 SU	1Q10 (Wet season) =	404 MGD	Wet Season - 1Q10 Mix =	100 %	90% Maximum pH =	8.26 SU
10% Maximum pH =	7.3 SU	30Q10 (Wet season) =	812 MGD	- 30Q10 Mix =	100 %	10% Maximum pH =	7.19 SU
Tier Designation (1 or 2) =	2	30Q5 =	563 MGD			Discharge Flow =	0.72 MGD
Public Water Supply (PWS) Y/N? =	Y	Harmonic Mean =	1144 MGD				
Trout Present Y/N? =	N	Annual Average =	MGD				
Early Life Stages Present Y/N? =	Y						

Parameter (ug/l unless noted)	Background Conc.		Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH		
Acenaphthene	0	0	1.2E+03	2.7E+03	9.4E+05	2.1E+06	2.7E+02	2.7E+02	1.2E+02	1.2E+02	9.4E+04	2.1E+05	9.4E+04	2.1E+05	9.4E+04	2.1E+05	9.4E+04	2.1E+05	9.4E+04	2.1E+05		
Acrolein	0	0	3.2E+02	7.8E+02	2.5E+05	6.1E+05	7.8E+01	7.8E+01	3.2E+01	3.2E+01	2.5E+04	6.1E+04	2.5E+04	6.1E+04	2.5E+04	6.1E+04	2.5E+04	6.1E+04	2.5E+04	6.1E+04		
Acrylonitrile ^c	0	0	5.9E+01	6.8E+00	9.4E+02	1.0E+04	6.6E-01	6.6E-01	5.9E-02	5.9E-02	9.4E+01	1.0E+03	9.4E+01	1.0E+03	9.4E+01	1.0E+03	9.4E+01	1.0E+03	9.4E+01	1.0E+03		
Aldrin ^c	0	0	1.3E+03	1.4E-03	2.1E+00	2.2E+00	1.4E-04	1.4E-04	1.3E-04	1.3E-04	2.1E+00	2.2E+00	2.1E+01	2.2E-01	2.1E+01	2.2E-01	2.1E+01	2.2E-01	2.1E+01	2.2E-01		
Ammonia-N (mg/l)	0.02	0.02	1.04E+00	1.79E+00	7.2E+02	7.2E+02	7.2E+02	7.2E+02	1.45E+00	2.75E-01	1.45E+00	2.75E-01	1.45E+00	2.75E-01	1.45E+00	2.75E-01	1.45E+00	2.75E-01	1.45E+00	2.75E-01		
Ammonia-N (mg/l) (High Flow)	0.02	0.02	1.79E+00	1.79E+00	2.0E+03	2.0E+03	2.0E+03	2.0E+03	1.45E+00	4.63E-01	1.45E+00	4.63E-01	1.45E+00	4.63E-01	1.45E+00	4.63E-01	1.45E+00	4.63E-01	1.45E+00	4.63E-01		
Anthracene	0	0	9.6E+03	1.1E+05	7.5E+06	8.6E+07	1.1E+04	1.1E+04	9.6E+02	9.6E+02	7.5E+05	8.6E+06	7.5E+05	8.6E+06	7.5E+05	8.6E+06	7.5E+05	8.6E+06	7.5E+05	8.6E+06		
Antimony	0	0	1.4E+01	4.3E+03	1.1E+04	3.4E+06	4.3E+02	4.3E+02	1.4E+00	1.4E+00	1.1E+04	3.4E+06	1.1E+04	3.4E+06	1.1E+04	3.4E+06	1.1E+04	3.4E+06	1.1E+04	3.4E+06		
Arsenic	0.35	0.35	1.5E+02	1.0E+01	9.3E+04	7.6E+03	1.0E+01	1.0E+01	1.5E+01	1.5E+01	9.3E+04	7.6E+03	1.5E+01	1.0E+01	1.5E+01	1.0E+01	1.5E+01	1.0E+01	1.5E+01	1.0E+01		
Barium	0	0	2.0E+03	7.1E+02	1.6E+06	1.1E+06	7.1E+02	7.1E+02	2.0E+02	2.0E+02	1.6E+06	1.1E+06	2.0E+02	7.1E+02	2.0E+02	7.1E+02	2.0E+02	7.1E+02	2.0E+02	7.1E+02		
Benzene ^c	0	0	1.2E+01	5.4E-03	1.9E+04	8.6E+00	5.4E-03	5.4E-03	1.2E+00	1.2E+00	1.9E+04	8.6E+00	1.2E+00	5.4E-03	1.2E+00	5.4E-03	1.2E+00	5.4E-03	1.2E+00	5.4E-03		
Benzidine ^c	0	0	4.4E-02	4.9E-01	7.0E+01	7.8E+02	4.9E-01	4.9E-01	4.4E-03	4.4E-03	7.0E+01	7.8E+02	4.4E-03	4.9E-01	4.4E-03	4.9E-01	4.4E-03	4.9E-01	4.4E-03	4.9E-01		
Benzo (a) anthracene ^c	0	0	4.4E-02	4.9E-01	7.0E+01	7.8E+02	4.9E-01	4.9E-01	4.4E-03	4.4E-03	7.0E+01	7.8E+02	4.4E-03	4.9E-01	4.4E-03	4.9E-01	4.4E-03	4.9E-01	4.4E-03	4.9E-01		
Benzo (b) fluoranthene ^c	0	0	4.4E-02	4.9E-01	7.0E+01	7.8E+02	4.9E-01	4.9E-01	4.4E-03	4.4E-03	7.0E+01	7.8E+02	4.4E-03	4.9E-01	4.4E-03	4.9E-01	4.4E-03	4.9E-01	4.4E-03	4.9E-01		
Benzo (k) fluoranthene ^c	0	0	4.4E-02	4.9E-01	7.0E+01	7.8E+02	4.9E-01	4.9E-01	4.4E-03	4.4E-03	7.0E+01	7.8E+02	4.4E-03	4.9E-01	4.4E-03	4.9E-01	4.4E-03	4.9E-01	4.4E-03	4.9E-01		
Benzo (a) pyrene ^c	0	0	4.4E-02	4.9E-01	7.0E+01	7.8E+02	4.9E-01	4.9E-01	4.4E-03	4.4E-03	7.0E+01	7.8E+02	4.4E-03	4.9E-01	4.4E-03	4.9E-01	4.4E-03	4.9E-01	4.4E-03	4.9E-01		
Bis(2-Chloroethyl) Ether	0	0	3.1E-01	1.4E+01	2.4E+02	1.1E+04	1.4E+01	1.4E+01	3.1E-02	3.1E-02	2.4E+02	1.1E+04	3.1E-02	1.4E+01	3.1E-02	1.4E+01	3.1E-02	1.4E+01	3.1E-02	1.4E+01		
Bis(2-Chloroisopropyl) Ether	0	0	1.4E+03	1.7E+05	7.0E+04	5.7E+06	1.7E+05	1.7E+05	1.4E+02	1.4E+02	7.0E+04	5.7E+06	1.4E+02	1.7E+05	1.4E+02	1.7E+05	1.4E+02	1.7E+05	1.4E+02	1.7E+05		
Bromoform ^c	0	0	4.4E+01	3.6E+03	7.0E+04	5.7E+06	3.6E+03	3.6E+03	4.4E+00	4.4E+00	7.0E+04	5.7E+06	4.4E+00	3.6E+03	4.4E+00	3.6E+03	4.4E+00	3.6E+03	4.4E+00	3.6E+03		
Butylbenzophthalate	0	0	3.0E+03	5.2E+03	2.3E+06	4.1E+06	5.2E+03	5.2E+03	3.0E+02	3.0E+02	2.3E+06	4.1E+06	3.0E+02	5.2E+03	3.0E+02	5.2E+03	3.0E+02	5.2E+03	3.0E+02	5.2E+03		
Butylbenzophthalate	0	0	3.0E+03	5.2E+03	2.3E+06	4.1E+06	5.2E+03	5.2E+03	3.0E+02	3.0E+02	2.3E+06	4.1E+06	3.0E+02	5.2E+03	3.0E+02	5.2E+03	3.0E+02	5.2E+03	3.0E+02	5.2E+03		
Cadmium	0	0	9.1E-01	5.0E+00	5.7E+02	3.9E+03	5.0E+01	5.0E+01	7.2E-01	2.3E-01	5.7E+02	3.9E+03	7.2E-01	5.0E+01	7.2E-01	5.0E+01	7.2E-01	5.0E+01	7.2E-01	5.0E+01		
Carbon Tetrachloride ^c	0	0	2.5E+00	4.4E+01	4.0E+03	7.0E+04	4.4E+01	4.4E+01	2.5E-01	2.5E-01	4.0E+03	7.0E+04	2.5E-01	4.4E+01	2.5E-01	4.4E+01	2.5E-01	4.4E+01	2.5E-01	4.4E+01		
Chlordane ^c	0	0	4.3E-03	2.1E-02	2.7E+00	3.5E+01	2.1E-02	2.1E-02	6.0E-01	1.1E-03	2.7E+00	3.5E+01	6.0E-01	2.1E-02	6.0E-01	2.1E-02	6.0E-01	2.1E-02	6.0E-01	2.1E-02		
Chloride	7.56	7.56	2.3E+05	2.5E+05	1.4E+08	2.0E+08	2.5E+05	2.5E+05	2.2E+05	5.8E+04	1.4E+08	2.0E+08	2.2E+05	2.5E+05	2.2E+05	2.5E+05	2.2E+05	2.5E+05	2.2E+05	2.5E+05		
TRC	0	0	1.9E+01	1.1E+01	6.8E+03	6.8E+03	6.8E+03	6.8E+03	4.8E+00	2.8E+00	6.8E+03	6.8E+03	4.8E+00	2.8E+00	4.8E+00	2.8E+00	4.8E+00	2.8E+00	4.8E+00	2.8E+00		
Chlorobenzene	0	0	6.8E+02	2.1E+04	5.3E+05	1.6E+07	2.1E+04	2.1E+04	6.8E+01	6.8E+01	5.3E+05	1.6E+07	6.8E+01	2.1E+04	6.8E+01	2.1E+04	6.8E+01	2.1E+04	6.8E+01	2.1E+04		

Parameter (ug/l unless noted)	Background			Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations							
	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH		
Chlorodibromomethane ^c	0	-	-	4.1E+00	3.4E+02	-	-	6.5E+03	5.4E+05	-	-	4.1E-01	3.4E+01	-	-	6.5E+02	5.4E+04	-	-	6.5E+02	5.4E+04	6.5E+02	5.4E+04
Chloroform ^c	0	-	-	3.5E+02	2.9E+04	-	-	5.6E+05	4.6E+07	-	-	3.5E+01	2.9E+03	-	-	5.6E+04	4.6E+06	-	-	5.6E+04	4.6E+06	5.6E+04	4.6E+06
2-Chloronaphthalene	0	-	-	1.7E+03	4.3E+03	-	-	1.3E+06	3.4E+06	-	-	1.7E+02	4.3E+02	-	-	1.3E+05	3.4E+05	-	-	1.3E+05	3.4E+05	1.3E+05	3.4E+05
2-Chlorophenol	0	-	-	1.2E+02	4.0E+02	-	-	9.4E+04	3.1E+05	-	-	1.2E+01	4.0E+01	-	-	9.4E+03	3.1E+04	-	-	9.4E+03	3.1E+04	9.4E+03	3.1E+04
Chlorpyrifos	0	8.3E-02	4.1E-02	-	-	4.1E+01	2.5E+01	-	-	2.1E-02	1.0E-02	-	-	1.0E+01	6.4E+00	-	-	1.0E+01	6.4E+00	1.0E+01	6.4E+00	-	-
Chromium III	0	4.8E+02	5.9E+01	-	-	2.3E+05	3.7E+04	-	-	1.1E+02	1.5E+01	-	-	5.7E+04	9.2E+03	-	-	5.7E+04	9.2E+03	5.7E+04	9.2E+03	-	-
Chromium VI	0	1.8E+01	1.1E+01	-	-	7.9E+03	6.8E+03	-	-	4.0E+00	2.8E+00	-	-	2.0E+03	1.7E+03	-	-	2.0E+03	1.7E+03	2.0E+03	1.7E+03	-	-
Chromium, Total	0.18	-	-	1.0E+02	-	-	-	7.8E+04	-	-	-	1.0E+01	-	-	7.8E+03	-	-	-	-	7.8E+03	-	-	-
Chrysene ^c	0	-	-	4.4E-02	4.9E-01	-	-	7.0E+01	7.8E+02	-	-	4.4E-03	4.9E-02	-	-	7.0E+00	7.8E+01	-	-	7.0E+00	7.8E+01	7.0E+00	7.8E+01
Copper	0.65	1.0E+01	7.1E+00	1.3E+03	-	4.8E+03	4.0E+03	1.0E+06	-	3.1E+00	2.3E+00	1.3E+02	-	1.2E+03	1.0E+03	1.0E+05	-	1.2E+03	1.0E+03	1.2E+03	1.0E+03	1.0E+05	-
Cyanide	0	2.2E+01	5.2E+00	7.0E+02	2.2E+05	1.1E+04	3.2E+03	5.5E+05	1.7E+08	5.5E+00	1.3E+00	7.0E+01	2.2E+04	2.7E+03	8.1E+02	5.5E+04	1.7E+07	2.7E+03	8.1E+02	2.7E+03	8.1E+02	5.5E+04	1.7E+07
DDD ^c	0	-	-	8.3E-03	8.4E-03	-	-	1.3E+01	1.3E+01	-	-	8.3E-04	8.4E-04	-	-	1.3E+00	1.3E+00	-	-	1.3E+00	1.3E+00	1.3E+00	1.3E+00
DDE ^c	0	-	-	5.9E-03	5.9E-03	-	-	9.4E+00	9.4E+00	-	-	5.9E-04	5.9E-04	-	-	9.4E+01	9.4E+01	-	-	9.4E+01	9.4E+01	9.4E+01	9.4E+01
DDT ^c	0	1.1E+00	1.0E-03	5.9E-03	5.9E-03	5.5E+02	6.2E-01	9.4E+00	9.4E+00	2.8E-01	2.5E-04	5.9E-04	5.9E-04	1.4E+02	1.6E-01	9.4E-01	9.4E-01	1.4E+02	1.6E-01	1.4E+02	1.6E-01	9.4E-01	9.4E-01
Demeton	0	-	-	1.0E-01	-	-	6.2E+01	-	-	-	2.5E-02	-	-	1.6E+01	-	-	-	1.6E+01	-	1.6E+01	-	-	-
Dibenz(a,h)anthracene ^c	0	-	-	4.4E-02	4.9E-01	-	-	7.0E+01	7.8E+02	-	-	4.4E-03	4.9E-02	-	-	7.0E+00	7.8E+01	-	-	7.0E+00	7.8E+01	7.0E+00	7.8E+01
Dibutyl phthalate	0	-	-	2.7E+03	1.2E+04	-	-	2.1E+06	9.4E+06	-	-	2.7E+02	1.2E+03	-	-	2.1E+05	9.4E+05	-	-	2.1E+05	9.4E+05	2.1E+05	9.4E+05
Dichloromethane	0	-	-	4.7E+01	1.6E+04	-	-	7.5E+04	2.5E+07	-	-	4.7E+00	1.6E+03	-	-	7.5E+03	2.5E+06	-	-	7.5E+03	2.5E+06	7.5E+03	2.5E+06
(Methylene Chloride) ^c	0	-	-	2.7E+03	1.7E+04	-	-	2.1E+06	1.3E+07	-	-	2.7E+02	1.7E+03	-	-	2.1E+05	1.3E+06	-	-	2.1E+05	1.3E+06	2.1E+05	1.3E+06
1,2-Dichlorobenzene	0	-	-	4.0E+02	2.6E+03	-	-	3.1E+05	2.0E+06	-	-	4.0E+01	2.6E+02	-	-	3.1E+04	2.0E+05	-	-	3.1E+04	2.0E+05	3.1E+04	2.0E+05
1,3-Dichlorobenzene	0	-	-	4.0E+02	2.6E+03	-	-	3.1E+05	2.0E+06	-	-	4.0E+01	2.6E+02	-	-	3.1E+04	2.0E+05	-	-	3.1E+04	2.0E+05	3.1E+04	2.0E+05
1,4-Dichlorobenzene	0	-	-	4.0E+01	7.7E-01	-	-	6.4E+02	1.2E+03	-	-	4.0E-02	7.7E-02	-	-	6.4E+01	1.2E+02	-	-	6.4E+01	1.2E+02	6.4E+01	1.2E+02
3,3-Dichlorobenzidine ^c	0	-	-	5.6E+00	4.6E+02	-	-	8.9E+03	7.3E+05	-	-	5.6E-01	4.6E+01	-	-	8.9E+02	7.3E+04	-	-	8.9E+02	7.3E+04	8.9E+02	7.3E+04
Dichlorobromomethane ^c	0	-	-	3.8E+00	9.9E+02	-	-	6.0E+03	1.6E+06	-	-	3.8E-01	9.9E+01	-	-	6.0E+02	1.6E+05	-	-	6.0E+02	1.6E+05	6.0E+02	1.6E+05
1,2-Dichloroethane ^c	0	-	-	3.1E+02	1.7E+04	-	-	2.4E+05	1.3E+07	-	-	3.1E+01	1.7E+03	-	-	2.4E+04	1.3E+06	-	-	2.4E+04	1.3E+06	2.4E+04	1.3E+06
1,1-Dichloroethylene	0	-	-	7.0E+02	1.4E+05	-	-	5.5E+05	1.1E+08	-	-	7.0E+01	1.4E+04	-	-	5.5E+04	1.1E+07	-	-	5.5E+04	1.1E+07	5.5E+04	1.1E+07
1,2-trans-dichloroethylene	0	-	-	9.3E+01	7.9E+02	-	-	7.3E+04	6.2E+05	-	-	9.3E+00	7.9E+01	-	-	7.3E+03	6.2E+04	-	-	7.3E+03	6.2E+04	7.3E+03	6.2E+04
2,4-Dichlorophenol	0	-	-	1.0E+02	-	-	-	7.8E+04	-	-	1.0E+01	-	-	7.8E+03	-	-	-	7.8E+03	-	7.8E+03	-	-	-
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	-	-	5.2E+00	3.9E+02	-	-	8.3E+03	6.2E+05	-	-	5.2E-01	3.9E+01	-	-	8.3E+02	6.2E+04	-	-	8.3E+02	6.2E+04	8.3E+02	6.2E+04
1,2-Dichloropropane	0	-	-	1.0E+01	1.7E+03	-	-	7.8E+03	1.3E+06	-	-	1.0E+00	1.7E+02	-	-	7.8E+02	1.3E+05	-	-	7.8E+02	1.3E+05	7.8E+02	1.3E+05
1,3-Dichloropropane	0	-	-	1.0E+01	1.7E+03	-	-	7.8E+03	1.3E+06	-	-	1.0E+00	1.7E+02	-	-	7.8E+02	1.3E+05	-	-	7.8E+02	1.3E+05	7.8E+02	1.3E+05
Dieldrin ^c	0	2.4E-01	5.6E-02	1.4E-03	1.4E-03	1.2E+02	3.5E+01	2.2E+00	2.2E+00	6.0E-02	1.4E-02	1.4E-04	1.4E-04	3.0E+01	8.7E+00	2.2E-01	2.2E-01	3.0E+01	8.7E+00	3.0E+01	8.7E+00	2.2E-01	2.2E-01
Diethyl Phthalate	0	-	-	2.3E+04	1.2E+05	-	-	1.8E+07	9.4E+07	-	-	2.3E+03	1.2E+04	-	-	1.8E+06	9.4E+06	-	-	1.8E+06	9.4E+06	1.8E+06	9.4E+06
Di-2-Ethylhexyl Phthalate ^c	0	-	-	1.8E+01	5.9E+01	-	-	2.9E+04	9.4E+04	-	-	1.8E+00	5.9E+00	-	-	2.9E+03	9.4E+03	-	-	2.9E+03	9.4E+03	2.9E+03	9.4E+03
2,4-Dimethylphenol	0	-	-	5.4E+02	2.3E+03	-	-	4.2E+05	1.8E+06	-	-	5.4E+01	2.3E+02	-	-	4.2E+04	1.8E+05	-	-	4.2E+04	1.8E+05	4.2E+04	1.8E+05
Dimethyl Phthalate	0	-	-	3.1E+05	2.9E+06	-	-	2.5E+08	2.3E+09	-	-	3.1E+04	2.9E+05	-	-	2.5E+07	2.3E+08	-	-	2.5E+07	2.3E+08	2.5E+07	2.3E+08
Di-n-Butyl Phthalate	0	-	-	2.7E+03	1.2E+04	-	-	2.1E+06	9.4E+06	-	-	2.7E+02	1.2E+03	-	-	2.1E+05	9.4E+05	-	-	2.1E+05	9.4E+05	2.1E+05	9.4E+05
2,4-Dinitrophenol	0	-	-	7.0E+01	1.4E+04	-	-	5.5E+04	1.1E+07	-	-	7.0E+00	1.4E+03	-	-	5.5E+03	1.1E+06	-	-	5.5E+03	1.1E+06	5.5E+03	1.1E+06
2-Methyl-4,6-Dinitrophenol	0	-	-	1.3E+01	7.65E+02	-	-	1.0E+04	6.0E+05	-	-	1.3E+00	7.7E+01	-	-	1.0E+03	6.0E+04	-	-	1.0E+03	6.0E+04	1.0E+03	6.0E+04
2,4-Dinitrotoluene ^c	0	-	-	1.1E+00	9.1E+01	-	-	1.7E+03	1.4E+05	-	-	1.1E-01	9.1E+00	-	-	1.7E+02	1.4E+04	-	-	1.7E+02	1.4E+04	1.7E+02	1.4E+04
Dioxin (2,3,7,8-tetrachlorodibenzo-p-dioxin) (ppt)	0	-	-	1.2E-06	1.2E-06	-	-	1.2E-06	1.2E-06	-	-	1.2E-07	1.2E-07	-	-	1.2E-07	1.2E-07	-	-	1.2E-07	1.2E-07	1.2E-07	1.2E-07
1,2-Diphenylhydrazine ^c	0	-	-	4.0E-01	5.4E+00	-	-	6.4E+02	8.6E+03	-	-	4.0E-02	5.4E-01	-	-	6.4E+01	8.6E+02	-	-	6.4E+01	8.6E+02	6.4E+01	8.6E+02
Alpha-Endosulfan	0	2.2E-01	5.6E-02	1.1E+02	2.4E+02	1.1E+02	3.5E+01	8.6E+04	1.9E+05	5.5E-02	1.4E-02	1.1E+01	2.4E+01	2.7E+01	8.7E+00	8.6E+03	1.9E+04	2.7E+01	8.7E+00	2.7E+01	8.7E+00	8.6E+03	1.9E+04
Beta-Endosulfan	0	2.2E-01	5.6E-02	1.1E+02	2.4E+02	1.1E+02	3.5E+01	8.6E+04	1.9E+05	5.5E-02	1.4E-02	1.1E+01	2.4E+01	2.7E+01	8.7E+00	8.6E+03	1.9E+04	2.7E+01	8.7E+00	2.7E+01	8.7E+00	8.6E+03	1.9E+04
Endosulfan Sulfate	0	-	-	1.1E+02	2.4E+02	-	-	8.6E+04	1.9E+05	-	-	1.1E+01	2.4E+01	-	-	8.6E+03	1.9E+04	-	-	8.6E+03	1.9E+04	8.6E+03	1.9E+04
Endrin	0	8.6E-02	3.6E-02	7.6E-01	8.1E-01	4.3E+01	2.2E+01	6.0E+02	6.3E+02	2.2E-02	9.0E-03	7.6E-02	8.1E-02	1.1E+01	5.6E+00	6.0E+01	6.3E+01	1.1E+01	5.6E+00	1.1E+01	5.6E+00	6.0E+01	6.3E+01
Endrin Aldehyde	0	-	-	7.6E-01	8.1E-01	-	-	6.0E+02	6.3E+02	-	-	7.6E-02	8.1E-02	-	-	6.0E+01	6.3E+01	-	-	6.0E+01	6.3E+01	6.0E+01	6.3E+01

3/11/2009 1:29:21 PM

Facility = Claytor Hydroelectric Plant Outfalls 001-004

Chemical = chlorine

Chronic averaging period = 4

WLAa = 17000

WLAc = 12000

Q.L. = 0.1

samples/mo. = 1

samples/wk. = 1

Summary of Statistics:

observations = 1

Expected Value = .4

Variance = .0576

C.V. = 0.6

97th percentile daily values = .973367

97th percentile 4 day average = .665516

97th percentile 30 day average = .482421

< Q.L. = 0

Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

0.4

3/11/2009 1:38:36 PM

Facility = Claytor Hydroelectric Plant Outfalls 005-008

Chemical = chlorine

Chronic averaging period = 4

WLAa = 23000

WLAc = 16000

Q.L. = 0.1

samples/mo. = 1

samples/wk. = 1

Summary of Statistics:

observations = 1

Expected Value = .32

Variance = .036864

C.V. = 0.6

97th percentile daily values = .778693

97th percentile 4 day average = .532412

97th percentile 30 day average = .385937

< Q.L. = 0

Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

0.32

3/11/2009 1:42:58 PM

Facility = Claytor Hydroelectric Plant Outfall 013

Chemical = chlorine

Chronic averaging period = 4

WLAa = 7900

WLAc = 5700

Q.L. = 0.1

samples/mo. = 1

samples/wk. = 1

Summary of Statistics:

observations = 1

Expected Value = 2.2

Variance = 1.7424

C.V. = 0.6

97th percentile daily values = 5.35351

97th percentile 4 day average = 3.66033

97th percentile 30 day average = 2.65331

< Q.L. = 0

Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

2.2

3/11/2009 1:48:19 PM

Facility = Claytor Hydroelectric Plant Outfall 014

Chemical = chlorine

Chronic averaging period = 4

WLAa = 9400

WLAc = 6800

Q.L. = 0.1

samples/mo. = 1

samples/wk. = 1

Summary of Statistics:

observations = 1

Expected Value = 1.72

Variance = 1.06502

C.V. = 0.6

97th percentile daily values = 4.18547

97th percentile 4 day average = 2.86171

97th percentile 30 day average = 2.07441

< Q.L. = 0

Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

1.72

3/11/2009 1:51:45 PM

Facility = Claytor Hydroelectric Plant Outfalls 001-004

Chemical = copper

Chronic averaging period = 4

WLAa = 8700

WLAc = 7200

Q.L. = 0.5

samples/mo. = 1

samples/wk. = 1

Summary of Statistics:

observations = 1

Expected Value = 10

Variance = 36

C.V. = 0.6

97th percentile daily values = 24.3341

97th percentile 4 day average = 16.6379

97th percentile 30 day average = 12.0605

< Q.L. = 0

Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

3/11/2009 1:53:01 PM

Facility = Claytor Hydroelectric Plant Outfalls 005-008

Chemical = copper

Chronic averaging period = 4

WLAa = 12000

WLAc = 9600

Q.L. = 0.5

samples/mo. = 1

samples/wk. = 1

Summary of Statistics:

observations = 1

Expected Value = 11

Variance = 43.56

C.V. = 0.6

97th percentile daily values = 26.7675

97th percentile 4 day average = 18.3016

97th percentile 30 day average = 13.2665

< Q.L. = 0

Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

3/11/2009 1:45:20 PM

Facility = Claytor Hydroelectric Plant Outfall 013

Chemical = copper

Chronic averaging period = 4

WLAa = 4000

WLAc = 3400

Q.L. = 0.5

samples/mo. = 1

samples/wk. = 1

Summary of Statistics:

observations = 1

Expected Value = .5

Variance = .09

C.V. = 0.6

97th percentile daily values = 1.21670

97th percentile 4 day average = .831895

97th percentile 30 day average = .603026

< Q.L. = 0

Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

0.5

3/11/2009 1:47:08 PM

Facility = Claytor Hydroelectric Plant Outfall 014

Chemical = copper

Chronic averaging period = 4

WLAa = 4800

WLAc = 4000

Q.L. = 0.5

samples/mo. = 1

samples/wk. = 1

Summary of Statistics:

observations = 1

Expected Value = 10

Variance = 36

C.V. = 0.6

97th percentile daily values = 24.3341

97th percentile 4 day average = 16.6379

97th percentile 30 day average = 12.0605

< Q.L. = 0

Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

APPENDIX E

NPDES PERMIT RATING WORK SHEET (1999)

NPDES Permit Rating Work Sheet

NPDES NO: V A 0 0 8 7 0 0 4

- Regular Addition
- Discretionary Addition
- Score change, but no status change
- Deletion

Facility Name:

C L A Y T O R L A K E H Y D R O E L E C T R I C P L A N T

City: R A D F O R D

Receiving Water: N E W R I V E R

Reach Number: _____

Is this facility a steam electric power plant (SIC=4911) with one or more of the following characteristics?

1. Power output 500 MW or greater (not using a cooling pond/lake)
2. A nuclear power plant
3. Cooling water discharge greater than 25% of the receiving stream's 7Q10 flow rate

YES; score is 600 (stop here) NO (continue)

Is this permit for a municipal separate storm sewer serving a population greater than 100,000?

- YES; score is 700 (stop here)
 NO (continue)

FACTOR 1: Toxic Pollutant Potential

PCS SIC Code: _____ Primary SIC Code: 4 9 1 1

Other SIC Codes: _____

Industrial Subcategory Code: 0 0 1 (Code 000 if no subcategory)

Determine the Toxicity potential from Appendix A. Be sure to use the TOTAL toxicity potential column and check one

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
<input type="checkbox"/> No process waste streams	0	0	<input type="checkbox"/> 3.	3	15	<input type="checkbox"/> 7.	7	35
<input type="checkbox"/> 1.	1	5	<input type="checkbox"/> 4.	4	20	<input type="checkbox"/> 8.	8	40
<input type="checkbox"/> 2.	2	10	<input checked="" type="checkbox"/> 5.	5	25	<input type="checkbox"/> 9.	9	45
			<input type="checkbox"/> 6.	6	30	<input type="checkbox"/> 10.	10	50

Code Number Checked: 0 6

Total Points Factor 1: 3 0

FACTOR 2: Flow/Stream Flow Volume *(Complete Either Section A or Section B; check only one)*

Section A--Wastewater Flow Only Considered

Wastewater Type (See Instructions)	Code	Points
Type I:		
Flow < 5 MGD	<input type="checkbox"/> 11	0
Flow 5 to 10 MGD	<input type="checkbox"/> 12	10
Flow > 10 to 50 MGD	<input type="checkbox"/> 13	20
Flow > 50 MGD	<input type="checkbox"/> 14	30
Type II:		
Flow < 1 MGD	<input type="checkbox"/> 21	10
Flow 1 to 5 MGD	<input type="checkbox"/> 22	20
Flow > 5 to 10 MGD	<input type="checkbox"/> 23	30
Flow > 10 MGD	<input type="checkbox"/> 24	50
Type III:		
Flow < 1 MGD	<input type="checkbox"/> 31	0
Flow 1 to 5 MGD	<input type="checkbox"/> 32	10
Flow > 5 to 10 MGD	<input type="checkbox"/> 33	20
Flow > 10 MGD	<input type="checkbox"/> 34	30

Section B--Wastewater and Stream Flow Considered

Wastewater Type (See Instructions)	Percent of Instream Wastewater Concentration at Receiving Stream Low Flow	Code	Points
Type I/III:	< 10%	<input checked="" type="checkbox"/> 41	0
	≥ 10% to < 50%	<input type="checkbox"/> 42	10
	≥ 50%	<input type="checkbox"/> 43	20
Type II:	<10%	<input type="checkbox"/> 51	0
	≥ 10% to < 50%	<input type="checkbox"/> 52	20
	≥ 50%	<input type="checkbox"/> 53	30

Code Checked from Section A or B: 4 1

Total Points Factor 2: 0

1
NPDES Permit Rating Work Sheet

NPDES No.: VA0087084

FACTOR 3: Conventional Pollutants
(only when limited by the permit)

A. Oxygen Demanding Pollutant: (check one) BOD COD Other: _____

Permit Limits: (check one)	<input type="checkbox"/>	< 100 lbs/day	Code	Points
	<input type="checkbox"/>	100 to 1000 lbs/day	1	0
	<input type="checkbox"/>	>1000 to 3000 lbs/day	2	5
	<input type="checkbox"/>	>3000 lbs/day 4	3	15
			20	

Code Checked:
Points Scored:

NA

B. Total Suspended Solids (TSS)

Permit Limits: (check one)	<input type="checkbox"/>	< 100 lbs/day	Code	Points
	<input type="checkbox"/>	100 to 1000 lbs/day	1	0
	<input type="checkbox"/>	>1000 to 5000 lbs/day	2	5
	<input type="checkbox"/>	>5000 lbs/day 4	3	15
			20	

Code Checked:
Points Scored:

NA

C. Nitrogen Pollutant: (check one) Ammonia Other: _____

Permit Limits: (check one)	<input type="checkbox"/>	< 300 lbs/day	Code	Points
	<input type="checkbox"/>	300 to 1000 lbs/day	1	0
	<input type="checkbox"/>	>1000 to 3000 lbs/day	2	5
	<input type="checkbox"/>	>3000 lbs/day 4	3	15
			20	

Code Checked:
Points Scored:

NA

Total Points Factor 3:

FACTOR 4: Public Health Impact

Is there a public drinking water supply located within 50 miles downstream of the effluent discharge (this includes any body of water to which the receiving water is a tributary)? A public drinking water supply may include infiltration galleries, or other methods of conveyance that ultimately get water from the above referenced supply.

YES (if yes, check toxicity potential number below)
 NO (if no, go to Factor 5)

Determine the human health toxicity potential from Appendix A. Use the same SIC code and subcategory reference as in Factor 1. (Be sure to use the human health toxicity group column -- check one below)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
<input type="checkbox"/> No process waste streams	0	0	<input type="checkbox"/> 3.	3	0	<input type="checkbox"/> 7.	7	15
<input type="checkbox"/> 1.	1	0	<input type="checkbox"/> 4.	4	0	<input type="checkbox"/> 8.	8	20
<input type="checkbox"/> 2.	2	0	<input type="checkbox"/> 5.	5	5	<input type="checkbox"/> 9.	9	25
			<input checked="" type="checkbox"/> 6.	6	10	<input type="checkbox"/> 10.	10	30

Code Number Checked:

Total Points Factor 4:

FACTOR 5: Water Quality Fact.

A. *Is (or will) one or more of the effluent discharge limits based on water quality factors of the receiving stream (rather than technology-based federal effluent guidelines, or technology-based state effluent guidelines), or has a wasteload allocation been assigned to the discharge?*

<input checked="" type="checkbox"/>	Yes	Code 1	Points 10	<i>transfer</i>
<input type="checkbox"/>	No	Code 2	Points 0	

B. *Is the receiving water in compliance with applicable water quality standards for pollutants that are water quality limited in the permit?*

<input checked="" type="checkbox"/>	Yes	Code 1	Points 0
<input type="checkbox"/>	No	Code 2	Points 5

C. *Does the effluent discharged from this facility exhibit the reasonable potential to violate water quality standards due to whole effluent toxicity?*

<input type="checkbox"/>	Yes	Code 1	Points 10
<input checked="" type="checkbox"/>	No	Code 2	Points 0

Code Number Checked: A 1 B 1 C 2
 Points Factor 5: A 10 + B 0 + C 0 = 10 TOTAL

FACTOR 6: Proximity to Near Coastal Waters

A. *Base Score: Enter flow code here (from Factor 2):* 41

Enter the multiplication factor that corresponds to the flow code:

Check appropriate facility HPRI Code (from PCS):

HPRI #	Code	HPRI Score	Flow Code	Multiplication Factor
<input type="checkbox"/>	1	1	11, 31, or 41	0.00
<input type="checkbox"/>	2	2	12, 32, or 42	0.05
<input type="checkbox"/>	3	3	13, 33, or 43	0.10
<input type="checkbox"/>	4	4	14 or 34	0.15
<input type="checkbox"/>	5	5	21 or 51	0.10
<input type="checkbox"/>	4	4	22 or 52	0.30
<input type="checkbox"/>	5	5	23 or 53	0.60
<input type="checkbox"/>	5	5	24	1.00

HPRI code checked:

Base Score: (HPRI Score) x (Multiplication Factor) = 0 (TOTAL POINTS)

B. **Additional Points--NEP Program**
For a facility that has an HPRI code of 3, does the facility discharge to one of the estuaries enrolled in the National Estuary Protection (NEP) program (see instructions) or the Chesapeake Bay?

C. **Additional Points--Great Lakes Area of Concern**
For a facility that has an HPRI code of 5, does the facility discharge any of the pollutants of concern into one of the Great Lakes' 31 areas of concern (see instructions)

<input type="checkbox"/>	Yes	Code 1	Points 10
<input type="checkbox"/>	No	Code 2	Points 0

<input type="checkbox"/>	Yes	Code 1	Points 10
<input type="checkbox"/>	No	Code 2	Points 0

Code Number Checked: A B C
 Points Factor 5: A + B + C = TOTAL

SCORE SUMMARY

Factor	Description	Total Points
1	Toxic Pollutant Potential	<u>30</u>
2	Flow/Stream Flow Volume	<u>0</u>
3	Conventional Pollutants	<u>0</u>
4	Public Health Impacts	<u>10</u>
5	Water Quality Factors	<u>10</u>
6	Proximity to Near Coastal Waters	<u>0</u>
TOTAL (Factors 1-6)		<u>50</u>

S1. Is the total score equal to or greater than 80? Yes (Facility is a major) No

S2. If the answer to the above question is no, would you like this facility to be discretionary major?

No

Yes (add 500 points to the above score and provide reason below:

Reason: _____

NEW SCORE: 50

OLD SCORE: 20

Lewis Pillis

Permit Reviewer's Name

540,562.6789

Phone Number

2-26-99

Date

APPENDIX F

OWNER COMMENTS AND DEQ RESPONSES

April 28, 2009 comment letter from owner

May 26, 2009 comment letter from owner

June 1, 2009 response letter from DEQ



**AMERICAN
ELECTRIC
POWER**

American Electric Power
1 Riverside Plaza
Columbus, OH 43215-2373
AEP.com

Mr. Robert S. Tate, P.E.
Environmental Engineer Senior
Virginia Department of Environmental Quality, West Central Regional Office
3019 Peters Creek Road
Roanoke, Virginia 24019

April 28, 2009

**RE: Appalachian Power Company – Claytor Hydroelectric Plant
Reissuance of VPDES Permit No. VA0087084
Draft Permit and Fact Sheet Owner Review Comments**

Dear Mr. Tate:

On behalf of Appalachian Power Company, American Electric Power Service Corporation (both hereby referenced as Company) submits owner review comments regarding the referenced draft permit fact sheet. These comments also detail specific items that we believe are in error and should be revised. The Company appreciates the opportunity to provide these comments, and believes that the Virginia Department of Environmental Quality (VDEQ) will find them useful.

VPDES PERMIT PROGRAM FACT SHEET

1. VPDES PERMIT PROGRAM FACT SHEET – ITEM 1. FACILITY NAME AND ADDRESS:

Below *LOCATION*: we recommend insertion of the following:

CORP. FACILITY CONTACT:

NAME: Alan R. Wood, P.E.

TITLE: Manager, Water & Ecological Resource Services

COMPANY NAME: American Electric Power Service Corp.

PHONE: (614) 716-1233

CORP. ENVIRONMENTAL CONTACT:

NAME: Jonathan M. Magalski

TITLE: Environmental Specialist

PHONE: (614) 716-2240

EMAIL: jmmagalski@aep.com

LOCAL STAFF CONTACTS:

NAME: David W. Bailey

PHONE: (540) 985-2864

EMAIL: dwbailey@aep.com

ALT. LOCAL STAFF CONTACTS:

NAME: Richard C. Haley
EMAIL: rchaley@aep.com
PHONE: (540) 985-2676

2. *VPDES PERMIT PROGRAM FACT SHEET – ITEM 2. OWNER CONTACT:*

The owner contact should be as follows:

OWNER CONTACT: (TO RECEIVE PERMIT)

NAME: John M. McManus
TITLE: Vice President, Environmental Services
COMPANY NAME: American Electric Power Service Corp.
ADDRESS: 1 Riverside Plaza, Columbus, OH 43215
PHONE: (614) 716-1268

3. *VPDES PERMIT PROGRAM FACT SHEET – ITEM 16. EFFLUENT SCREENING & LIMITATION DEVELOPMENT:*

The bullet number for Item 16. (*EFFLUENT SCREENING & LIMITATION DEVELOPMENT:*) is missing. Please insert bullet 16.

4. *VPDES PERMIT PROGRAM FACT SHEET – ITEM 16. EFFLUENT SCREENING & LIMITATION DEVELOPMENT: PCBs:*

The Company does not believe PCB monitoring at Claytor is appropriate as discussed below. Further, we do not believe PCB monitoring should be conducted on Outfall 013 because it is an infrequent and atypical discharge, redundant of monitoring at Outfall 014 and effluent quality is better characterized by Outfall 014. Outfall 013 is only utilized during draft tube dewatering. During draft tube dewatering, the draft tube is isolated and drained into the main Plant sump. At this time, the 50 horsepower pump is utilized to pump the extra flow out of the sump via Outfall 013. Under normal operations, water in the sump is pumped via two (2) 10 horsepower pumps via Outfall 014.

5. *VPDES PERMIT PROGRAM FACT SHEET – ITEM 25. 303(d) LISTED SEGMENTS (TMDL):*

Polychlorinated biphenyl (PCB) concentrations at the levels to be monitored are ubiquitous; in the air, on the land and in the water. The Company has several concerns and reservations regarding the VPDES permit required monitoring for PCB's to support the development and implementation of the TMDL scheduled in the New River, and request that the requirement be removed from the permit. First, any PCB monitoring should be requested under separate cover and not made part of the VPDES permit as suggested in VDEQ Guidance Memo 09-2001. We prefer the request to conduct PCB monitoring be requested under Section 308 rather than Section 402 of the CWA. Although PCB containing equipment or components may occur at Claytor, none of the equipment or components should be directly associated with Claytor's power production or the VPDES permit in which the PCB

Mr. Robert S. Tate, P.E.

April 28, 2009

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monitoring is being required. Any equipment or components in which PCB's may be present at Claytor are either/and/or 1) properly maintained, 2) provided with secondary containment, 3) have low risk of failure and 4) best management practices are routinely employed to prevent environmental contamination.

The Company also has concerns regarding the sampling and analyses methodologies being required for the PCB monitoring. First, EPA Method 1668 has not been promulgated by EPA in accordance with NPDES regulations and with 40 CFR 136, and should not be used. EPA Method 1668 is performance based, allowing for the quantifications to be determined by the limited number of laboratories providing analytical services utilizing this methodology. Given the extremely low-level the method provides and the variability of the laboratories and the to-be-determined quantification limit, it is unclear how this data will be used. For instance, one facility may report less than some quantification limit while another facility may report a level at or below the quantification limit of the other facility. Does this mean the facility reporting a value is required to develop a Pollutant Minimization Plan (PMP) while the other facility that reported a less than quantification limit is not required to develop a PMP because of the laboratory analytical differences? Additionally, as provided in VDEQ Guidance Memo 09-2001, VDEQ has provided a list of laboratories capable of performing EPA Method 1668, none of which are in the State of Virginia. With development and implementation of an Environmental Laboratory Certification Program in Virginia, we suspect the number of available laboratories with a Virginia certification will decrease.

As a result of the above information and concerns, we request the PCB monitoring requirement be removed from the permit and handled as a separate information request outside of the context of the VPDES permit.

DRAFT VPDES PERMIT

6. VPDES PERMIT PART I.B.8. - PCB MONITORING

As discussed above in Comments 4 and 5 above, the Company requests PCB monitoring be removed from the permit.

We appreciate the opportunity to conduct an owner review of the proposed draft VPDES Permit and Fact Sheet for Claytor. Upon review and hopeful agreement to the provided comments, please proceed with issuing the public notice. Additional comments may be provided on the draft permit once public noticed. If you have any questions or need clarification, please contact Jon Magalski of my staff at (614) 716-2240 or at jmmagalski@aep.com. Thank you for your attention to this matter.

Sincerely,



Alan R. Wood, P.E.

Manager, Water & Ecological Resources Services - AEPS



**AMERICAN
ELECTRIC
POWER**

American Electric Power
1 Riverside Plaza
Columbus, OH 43215-2373
AEP.com

Mr. Robert S. Tate
Environmental Engineer Senior
Virginia Department of Environmental Quality, West Central Regional Office
3019 Peters Creek Road
Roanoke, Virginia 24019

May 26, 2009

**RE: Appalachian Power Company – Claytor Hydroelectric Plant
Reissuance of VPDES Permit No. VA0087084
Draft Permit and Fact Sheet Comments**

Dear Mr. Tate:

On behalf of Appalachian Power Company, American Electric Power Service Corporation (both hereby referenced as Company) submits comments regarding the referenced draft permit and fact sheet. These comments are in addition to those provided via letter dated April 28, 2009 (enclosed for the record during the public comment period). The Company appreciates the opportunity to provide comments to the Virginia Department of Environmental Quality (VDEQ) regarding this reissuance.

VPDES Permit

1. Part I.A.4. – Outfall 013 Limitations and Monitoring Requirements.

The Company does not believe effluent limitations or monitoring requirements at Outfall 013 are appropriate or warranted. The discharge that comprises Outfall 013 is the excess water in the Plant sump generated during draft tube dewatering. During normal operating circumstances, there is no discharge from Outfall 013. Whenever maintenance is required within the draft tube, the intake and exit gates are sealed and the trapped river intake water is drained to the Plant sump where the majority of the water is discharged through Outfall 013. Since this water is primarily intake water, with the exception of some water from the Plant sump that is discharged through Outfall 014 under normal conditions as well as during draft tube dewatering, the effluent quality is best represented by the monitoring of Outfall 014 as specified in Part I.A.5.

2. Part I.B.8. – PCB Monitoring

The Company continues to believe that the request to conduct low level PCB monitoring be requested under Section 308 rather than Section 402 of the CWA. The Company further has concerns regarding how the data will be used and interpreted, the methodology of EPA Method 1668, limited availability of analytical laboratories, costs of the sampling and analyses, etc. As a result of these concerns, we request the PCB monitoring requirement be removed from the permit and handled as a separate information request outside of the context of the VPDES permit. If the PCB monitoring requirements remain in the permit, the Company requests extension of the compliance schedule provided in the

Mr. Robert S. Tate

May 26, 2009

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draft permit by one year for each task. This will allow time for thorough and thoughtful planning of the sampling, and allow for additional time for the Company to better grasp the techniques.

VPDES Permit Fact Sheet

3. VPDES Permit Fact Sheet – Item 3. Owner Contacts – Local Staff Contact

David Bailey's email address is dwbailey@aep.com. Please remove the "i" after the "dwbailey".

We appreciate the opportunity to review the draft permit and fact sheet for Claytor. If you have any questions or would like to further discuss any of the provided comments, please contact Jon Magalski of my staff at (614) 716-2240 or at jmmagalski@aep.com. Thank you for your attention to this matter.

Sincerely,

Handwritten signature of Alan R. Wood in cursive, with the initials "ARW" in parentheses at the end.

Alan R. Wood, P.E.

Manager, Water & Ecological Resources Services – AEPSC

Enclosure



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

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June 1, 2009

Alan R. Wood, P.E.
Manager, Water & Ecological Resource Services
American Electric Power Service Corporation
1 Riverside Plaza
Columbus, OH 43215-2373

RE: VPDES Permit VA0087084 for Appalachian Power Company – Claytor Hydroelectric Plant;
Responses to Draft Permit and Draft Fact Sheet Owner Review Comments

Dear Mr. Wood:

This letter is the department's response to owner review comments dated April 28, 2009 and May 26, 2009 concerning the draft permit and draft sheet for reissuance of VPDES permit VA0087084.

Starting with the April comments, responses to the specific requests are listed below. Any changes were made previously.

1. Contact information was added with the exception of the alternate local staff contact (Richard Haley).
2. John McManus was added as a contact to receive the permit.
3. Bullet 16 was inserted for draft fact sheet item 16.
4. PCB monitoring at Outfall 013 was removed from draft fact sheet item 16.
5. No changes were made to draft fact sheet item 25. This item contains information regarding the PCB impairment and TMDL development. The request is addressed in the next response.
6. The request that PCB monitoring be removed from Part I.B.8 of the draft permit was not honored.

Responses to the May comments are listed below.

1. There does not appear to be a specific request concerning Part I.A.4 of the draft permit. Limits and monitoring for Outfall 013 will not be changed from those proposed in the draft permit. The proposed limits are the same as in the current permit. Monitoring frequencies are proposed to be quarterly. Outfall 013 monitoring in the current permit is annual. However monitoring is not required if the outfall does not discharge during a quarter. The writer believes that Outfall 013 discharges approximately once a year, so monitoring frequencies would not effectively change. The only anticipated change is the initiation of monitoring for oil and grease. The application indicates that oil and grease was detected at 25.4 mg/l (above DEQ's limit of 15 mg/L).
2. The request that PCB monitoring be removed from Part I.B.8 of the draft permit will not be honored. Part I.B.8.f.1, 2 of the PCB monitoring compliance schedule will be extended to October 10, 2010 and October 10, 2011 respectively.
3. David Bailey's email address (draft fact sheet item 3) will be corrected.

Should you have any further questions or concerns, please contact me at bob.tate@deq.virginia.gov or (540) 562-6774.

Sincerely,

Robert S. Tate, P.E.
water permit writer